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WATER POLLUTION SURVEILLANCE SYSTEM. VOLUME 10. PACIFIC NORTHWEST BASIN; ALASKA BASIN

Public Health Service
Washington, D. C.

30 September 1963

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PACIFIC NORTHWEST BASIN
ALASKA BASIN
volume 10

PUBLIC HEALTH SERVICE

Water Pollution Surveillance System

ANNUAL COMPILATION OF DATA

October 1, 1962 • September 30, 1963

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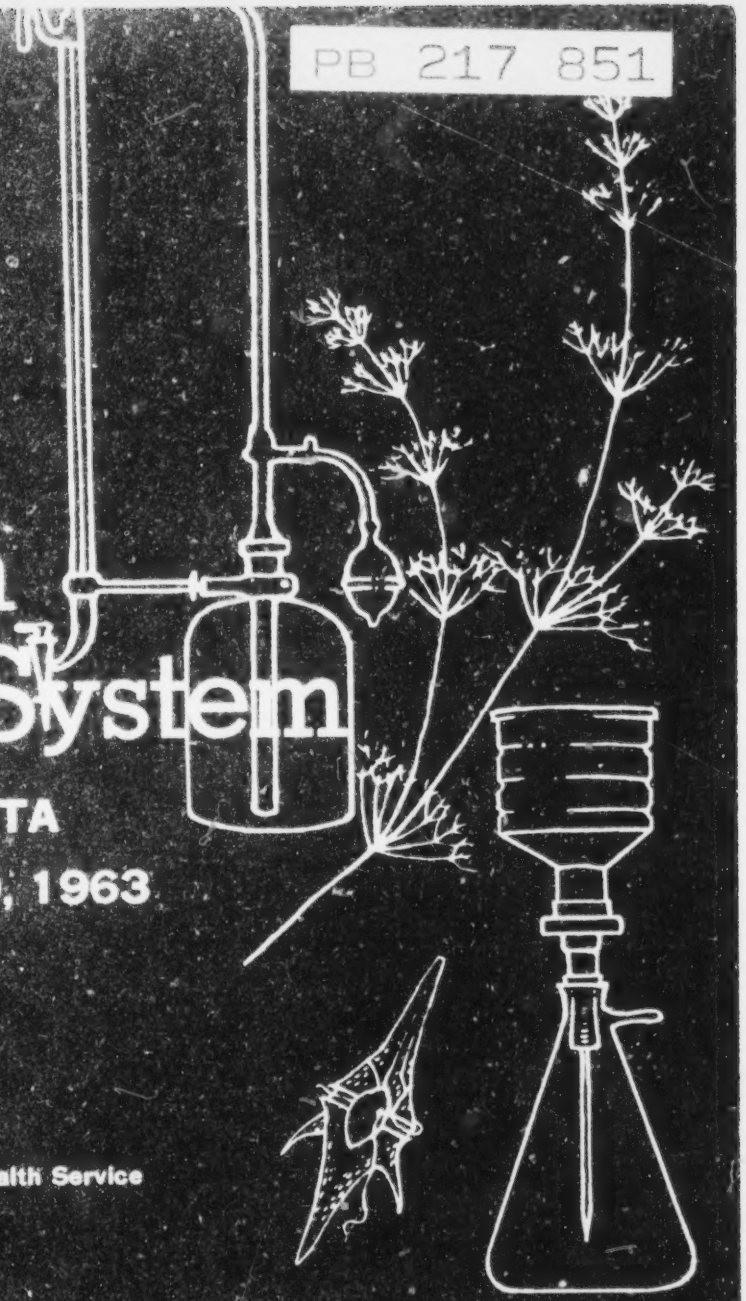

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE • Public Health Service

PACIFIC NORTHWEST BASIN
ALASKA BASIN
Volume 10

Public Health Service
Water Pollution Surveillance System

ANNUAL COMPILATION OF DATA
October 1, 1962 - - - September 30, 1963

A Federal, State and Local cooperative report on water pollution surveillance of surface waters at selected locations throughout the United States

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service, Division of Water Supply and Pollution Control
Washington, D.C. 20201

I

RELATED PUBLICATIONS:

National Water Quality Network
Annual Compilation of Data, October 1, 1957–September 30, 1958
Public Health Service Publication No. 663 (1958 Edition)

National Water Quality Network
Statistical Summary of Selected Data, October 1, 1957–September 30, 1958
Public Health Service Publication No. 663—Supplement 1

National Water Quality Network
Annual Compilation of Data, October 1, 1958–September 30, 1959
Public Health Service Publication No. 663 (1959 Edition)

National Water Quality Network
Annual Compilation of Data, October 1, 1959–September 30, 1960
Public Health Service Publication No. 663 (1960 Edition)

National Water Quality Network
Plankton Population Dynamics, July 1, 1959–June 30, 1961
Public Health Service Publication No. 663—Supplement 2

National Water Quality Network
Annual Compilation of Data, October 1, 1960–September 30, 1961
Public Health Service Publication No. 663 (1961 Edition)

National Water Quality Network
Annual Compilation of Data, October 1, 1961–September 30, 1962
Public Health Service Publication No. 663 (1962 Edition)

ACKNOWLEDGMENT

To increase the usefulness of the water quality data, annual compilations since 1958, including this one, have presented preliminary and unadjusted flow data for gaging stations at or near most of the Public Health Service Water Pollution Surveillance System sampling points. Final data may be obtained directly from the agency concerned. Any studies using the provisional flow data herein compiled should verify the data prior to completion of reports on such studies. For making the flow information available for this publication, grateful acknowledgment is made by the Public Health Service to:

The International Boundary and Water Commission,
United States and Mexico

The International Joint Commission, United States and Canada

The U.S. Department of the Interior
Bureau of Reclamation • Geological Survey

The U.S. Department of the Army
Corps of Engineers • Lake Survey

FOREWORD

This is the sixth annual compilation of data from the Public Health Service Water Pollution Surveillance System (formerly the National Water Quality Network). During this year, the System was increased from 122 to 128 stations. In order to provide data in a form more useful for local or regional water pollution control officials and their staffs, the present compilation is published in 11 separate volumes. The surveillance data reported herein reveal additional findings on pesticides and other organic chemicals in surface waters and on trends in radioactivity and other areas.

The Public Health Service gratefully acknowledges the assistance to our Surveillance System of the participating local, State and Federal Government agencies and private industry. The success of this program depends, in a large measure, upon their continued interest and support.

GORDON E. MCCALLUM, D. Sc.,
Assistant Surgeon General,
Chief, Division of Water Supply and Pollution Control

VOLUME 1

Northeast Basin

CONNECTICUT RIVER
at Enfield Dam, Conn.
below Northfield, Mass.
at Wilder, Vt.

HUDSON RIVER
below Poughkeepsie, N.Y.

LAKE ERIE
at Buffalo, N.Y.

MERRIMACK RIVER
above Lowell, Mass.

RARITAN RIVER
at Perth Amboy, N.J.

ST. LAWRENCE RIVER
at Massena, N.Y.

VOLUME 2

North Atlantic Basin

DELAWARE RIVER
at Philadelphia, Pa.
at Trenton, N.J.
at Martins Creek, Pa.

POTOMAC RIVER
at Washington, D.C.
at Great Falls, Md.
at Williamsport, Md.

SCHUYLKILL RIVER
at Philadelphia, Pa.

SHENANDOAH RIVER
at Berryville, Va.

SUSQUEHANNA RIVER
at Conowingo, Md.
at Sayre, Pa.

VOLUME 3

Southeast Basin

APALACHICOLA RIVER
at Chattahoochee, Fla.

CHATTAHOOCHEE RIVER
at Columbus, Ga.
at Lanett, Ala.
at Atlanta, Ga.

ESCAMBIA RIVER
at Century, Fla.

ROANOKE RIVER
at John H. Kerr Dam and
Reservoir, Va.

SAVANNAH RIVER
at Port Wentworth, Ga.
at North Augusta, S.C.

TOMBIGBEE RIVER
below Columbus, Miss.

VOLUME 4

Western Great Lakes and Lake Erie Basins

WESTERN GREAT LAKES

DETROIT RIVER
at Detroit, Mich.

LAKE MICHIGAN
at Gary, Ind.
at Milwaukee, Wis.

LAKE SUPERIOR
at Duluth, Minn.

ST. CLAIR RIVER
at Port Huron, Mich.

ST. MARYS RIVER
at Sault Ste. Marie, Mich.

LAKE ERIE BASIN

CUYAHOGA RIVER
at Cleveland, Ohio

MAUMEE RIVER
at Toledo, Ohio

VOLUME 5

Ohio and Tennessee River Basins

OHIO RIVER BASIN

ALLEGHENY RIVER
at Pittsburgh, Pa.

CUMBERLAND RIVER
at Clarksville, Tenn.

KANAWHA RIVER
at Winfield Dam, W. Va.

LITTLE MIAMI RIVER
at Cincinnati, Ohio

MONONGAHELA RIVER
at Pittsburgh, Pa.

OHIO RIVER
at Cairo, Ill.
at Evansville, Ind.
at Louisville, Ky.
at Cincinnati, Ohio
at Huntington, W. Va.
below Addison, Ohio
at Toronto, Ohio

WABASH RIVER
at New Harmony, Ind.

TENNESSEE RIVER BASIN

CLINCH RIVER
above Kingston, Tenn.
at Clinton, Tenn.

TENNESSEE RIVER
at Pickwick Landing, Tenn.
at Bridgeport, Ala.
at Chattanooga, Tenn.
at Lenoir City, Tenn.

VOLUME 6

Upper Mississippi River Basin

ILLINOIS RIVER
near Grafton, Ill.
at Peoria, Ill.

MISSISSIPPI RIVER
at Cape Girardeau, Mo.
at East St. Louis, Ill.
at Burlington, Iowa
at Dubuque, Iowa
at Lock and Dam 3 below St. Paul, Minn.

RAINY RIVER
at Baudette, Minn.
at International Falls, Minn.

RED RIVER (NORTH)
at Grand Forks, N. Dak.

VOLUME 7

Missouri River Basin

BIG HORN RIVER
at Hardin, Mont.

BIG SIOUX RIVER
below Sioux Falls, S. Dak.

KANSAS RIVER
at DeSoto, Kans.

MISSOURI RIVER
at St. Louis, Mo.
at Missouri City, Mo.
at Kansas City, Kans.
at St. Joseph, Mo.
at Omaha, Nebr.
at Yankton, S. Dak.
at Bismarck, N. Dak.
at Williston, N. Dak.

NORTH PLATTE RIVER
above Henry, Nebr.

PLATTE RIVER
above Plattsmouth, Nebr.

SOUTH PLATTE RIVER
at Julesburg, Colo.

YELLOWSTONE RIVER
near Sidney, Mont.

VOLUME 8

Southwest-Lower Mississippi River Basin

ARKANSAS RIVER
at Pendleton Ferry, Ark.
at Little Rock, Ark.
near Forth Smith, Ark.
near Ponca City, Okla.
at Coolidge, Kans.

MISSISSIPPI RIVER
at New Orleans, La.
at Delta, La.
at Vicksburg, Miss.
at West Memphis, Ark.

OUACHITA RIVER
at Bastrop, La.

RED RIVER (SOUTH)
at Alexandria, La.
at Bossier City, La.
at Index, Ark.
at Denison, Tex.

VERDIGRIS RIVER
at Nowata, Okla.

VOLUME 9

Colorado River and Western Gulf Basins

COLORADO RIVER BASIN

ANIMAS RIVER
at Cedar Hill, N. Mex.

COLORADO RIVER
at Yuma, Ariz.
above Parker Dam, Ariz.-Calif.
near Boulder City, Nev.
at Page, Ariz.
at Loma, Colo.

GREEN RIVER
at Dutch John, Utah

SAN JUAN RIVER
at Shiprock, New Mex.

WESTERN GULF BASIN

RIO GRANDE
at Brownsville, Tex.
at Laredo, Tex.
at El Paso, Tex.
below Alamosa, Colo.

SABINE RIVER
near Ruliff, Tex.

VOLUME 10

Pacific Northwest and Alaska Basins

PACIFIC NORTHWEST

CLEARWATER RIVER
at Lewiston, Idaho

COLUMBIA RIVER
at Clatskanie, Oreg.
at Bonneville, Oreg.
at McNary Dam, Oreg.
at Pasco, Wash.
at Wenatchee, Wash.
at Northport, Wash.

PEND OREILLE RIVER
at Albeni Falls Dam, Idaho

SNAKE RIVER
at Ice Harbor Dam, Wash.
at Wawawai, Wash.
at Payette, Idaho

SPOKANE RIVER
at Post Falls Dam, Idaho

WILLAMETTE RIVER
at Portland, Oreg.

YAKIMA RIVER
at Richland, Wash.

ALASKA BASIN

CHENA RIVER
at Fairbanks, Alaska

SHIP CREEK
at Anchorage, Alaska

VOLUME 11

California and the Great Basins

CALIFORNIA BASIN

KLAMATH RIVER
near Keno, Oreg.

SACRAMENTO RIVER
at Greens Landing above Courtland, Calif.

SAN JOAQUIN RIVER
near Vernalis, Calif.

GREAT BASIN

BEAR RIVER
above Preston, Idaho

TRUCKEE RIVER
at Calif.-Nev. Border
at Farad, Calif.

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ANALYTICAL AND FLOW DATA INDEX

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THE PUBLIC HEALTH SERVICE

Water Pollution Surveillance System

The Public Health Service program for providing fundamental information on the quality of the Nation's waters stems from Public Law 660, approved July 9, 1956, as amended by Public Law 87-88, July 20, 1961. Section 4(c) thereof states: ". . . the Secretary (of Health, Education, and Welfare) shall in cooperation with other Federal, State, and local agencies having related responsibilities, collect and disseminate basic data on chemical, physical, and biological water quality insofar as such data or other information relate to water pollution and the prevention and control thereof."

To fulfill this responsibility, the Public Health Service Water Pollution Surveillance System collects, interprets, and disseminates:

a. Information on changes in water quality at key points in river systems, as such quality may be affected by changes in water use and development.

b. Continuous information on the nature and extent of pollutants affecting water quality.

c. Data which will be useful in the development of comprehensive water resources programs.

d. Data which will assist State, interstate, and other agencies in their water pollution control programs, and in the selection of sites for legitimate water uses.

Some 50 sampling stations were established when the program started, October 1, 1957. By September 30, 1963, the number had grown to 128.

Each sampling location satisfies one or more of the following criteria:

a. Major waterways used for public water supply, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other legitimate uses.

b. Interstate, coastal, and international boundary waters.

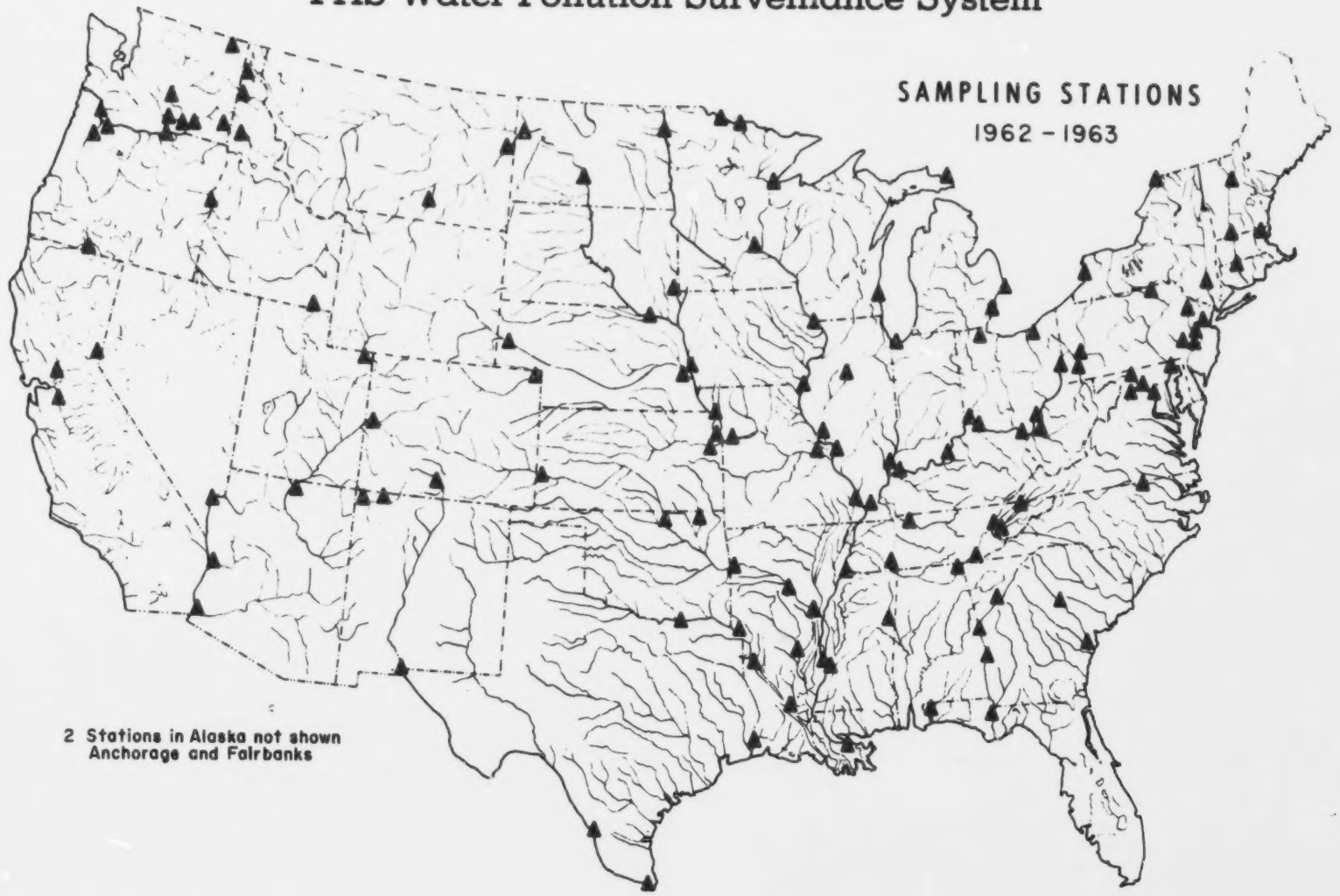
c. Waters on which activities of the Federal Government may have an impact.

Sampling station sites are fixed only after consultation with local, State, Federal and other agencies having related interests.

Active local participation is important in this operation. It assures maximum development of all information valuable both locally and nationally. Program costs are shared by the Federal Government and State and local agencies, those of the latter through contributions of laboratory and sampling manpower. Specifically, the State and local agencies perform certain of the conventional chemical analyses and collect samples for the newer, more complex examinations. The Public Health Service, in turn, performs the more complex determinations and makes the results available to the participants and to the public. In addition, the consultation, training facilities, and other resources of the Public Health Service are available to the cooperating agencies.

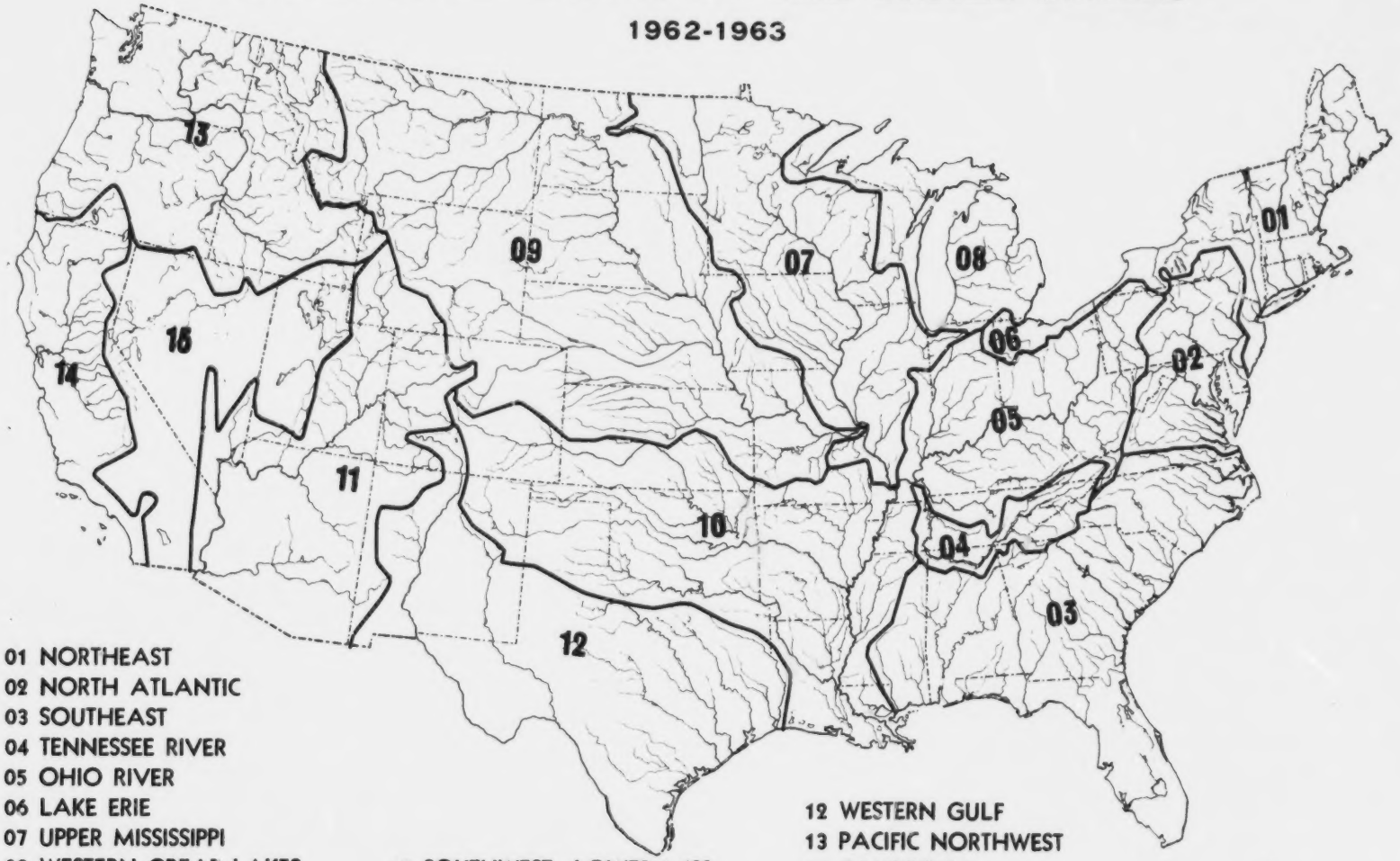
Locations of sampling stations in operation as of September 30, 1963, are shown on page 2. Descriptions of the stations, participating agencies, and other pertinent information are presented with the station data.

PHS Water Pollution Surveillance System



MAJOR RIVER BASINS OF THE UNITED STATES

1962-1963



01 NORTHEAST
02 NORTH ATLANTIC
03 SOUTHEAST
04 TENNESSEE RIVER
05 OHIO RIVER
06 LAKE ERIE
07 UPPER MISSISSIPPI
08 WESTERN GREAT LAKES
09 MISSOURI RIVER

10 SOUTHWEST—LOWER MISS.
11 COLORADO RIVER

12 WESTERN GULF
13 PACIFIC NORTHWEST
14 CALIFORNIA
15 GREAT BASIN

Only after careful screening of needs in water resource development was a pattern set for analyses of water samples.
All System samples are examined for:

a. Radioactivity.
   (1) Gross alpha.
   (2) Gross beta.
   (3) Strontium 90.
b. Plankton populations.
c. Coliform organisms.
d. Organic chemicals.
e. Biochemical, chemical, and physical measurements, including biochemical oxygen demand (BOD), dissolved oxygen (DO), chemical oxygen demand (COD), chlorine demand, ammonia nitrogen, hydrogen ion concentration (pH), color turbidity, temperature, alkalinity, hardness, chloride, sulfate, phosphates and total dissolved solids.
f. Sodium, potassium, fluoride and trace elements.

Samples for groups c and e were collected and analyzed weekly. Samples for organic chemicals were collected and analyzed monthly and plankton organism examinations were conducted semimonthly. Water samples for analysis of suspended and dissolved gross alpha and beta radioactivity were submitted weekly. Strontium 90 analyses were made on composites of weekly samples accumulated over 3-month periods. Sodium, potassium, fluoride, and trace metals were also determined on 3-month composites of weekly samples. New parameters which are developed and found significant will be included as the program continues.

Analytical Methods and Reliability of Data

The physical, chemical and biochemical data documented in this publication are the result of efforts of the cooperating agencies. In general, about half of these measurements were contributed by their laboratories. Specifically, all measurements reported for temperature, pH, DO, BOD, COD, chlorine demand and ammonia nitrogen were performed by the participants at the sample collection point. In addition, about 45 of the participating groups regularly perform all or most of the determinations for the remaining parameters included in the data. Whenever possible, analyses for stable constituents not completed by the participants are completed in the central Water Quality laboratories. While individual laboratories make minor modifications to meet local conditions, the methods used in most cases are those published in the 11th edition, "Standard Methods for the Examination of Water and Wastewater" (22). For uniformity, the chlorine demand test is reported on the basis of the starch-iodide titration procedure, and the chemical oxygen demand test is restricted to the use of 0.025 N reagents.

To assure continued reliability in the published data, frequent analysis of reference samples are made by each cooperating laboratory as an integral part of the overall program. Periodically a synthetic standard sample is provided to each participant for reference analysis. The reported results are reviewed. Any significant errors are called to the attention of the reporting laboratory and, after the cause of the errors has been determined, the previously submitted data are either corrected or discarded. From these findings, the analyses reported in this compilation are believed to be accurate to ± 10 percent of the reported values.

The analytical methods used by the Public Health Service laboratories are described in the discussion of water quality parameters which follows, and are covered by references listed in the Bibliography.

Water Pollution Parameters

In the assessment of water pollution, all of the legitimate purposes for which raw waters can be used, and which may be affected by pollution, must be considered. These may range from the minimum requirements for navigation to the ultimate in water quality demanded for certain industrial processing. Standards differ considerably, therefore, according to water use.

For domestic use, water must be free of disease organisms, clear, colorless, taste- and odor-free, and have a relatively low dissolved mineral content. Agricultural water is judged primarily on its mineral content, especially with respect to the ratio of sodium to other cations, and the presence of boron. Water for fish propogation and recreational purposes must be relatively free from domestic and industrial pollution and must be able to sustain an active flora of the smaller aquatic organisms on which fish and wildlife feed. Industrial water quality demands run the gamut from the complete absence of minerals to a requirement of low temperature, the critical factor in water used for cooling. The effects of radioactive materials on these uses have not yet been fully appraised.

The various laboratory examinations made as part of this program are discussed below.

Radioactivity

Radioactivity, long recognized as a water contaminant from natural sources, has continued to grow in importance and health significance with the development of nuclear energy for both military and peaceful uses. Consequently, levels must be measured continually as new sources are established.

Gross alpha and beta measurements are made on both suspended and dissolved solids in the raw surface water samples. The total radioactivity in the dissolved solids provides a rough measure of the levels which may be found in a treated water, where water treatment removes substantially all of the suspended matter.

Beta activity levels generally reflect the variable contamination resulting from fallout and discharges from nuclear energy installations, institutions utilizing radioactive materials, and other manmade sources. The trend of gross beta radioactivity in samples received from 47 of the Public Health Service Water Pollution Surveillance System stations operating since 1957 is presented in Figure 1. During the first three quarters of the 1962 water year, renewed weapons testing resulted in a rise in gross beta radioactivity in surface waters of the United States. During the sec-

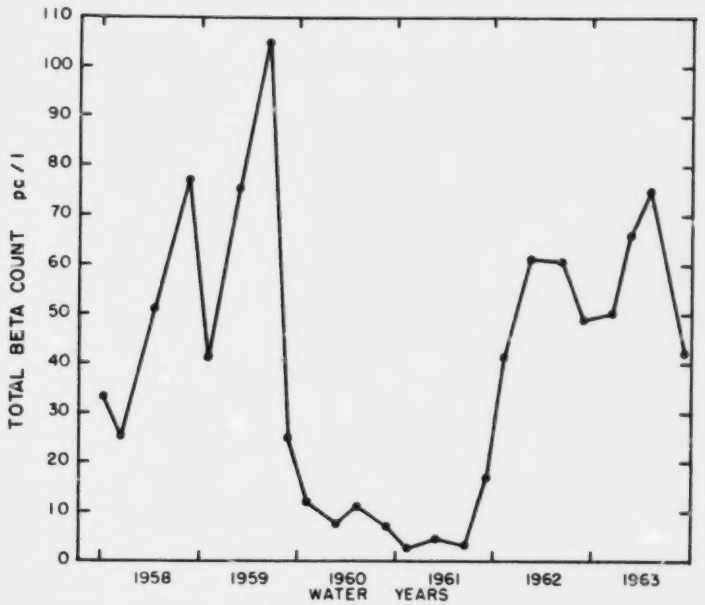


FIGURE 1. GROSS BETA RADIOACTIVITY IN THE SURFACE WATERS OF THE UNITED STATES.

ond and third quarter of water year 1963, the national average activity reached a maximum of 75 pico curies per liter and then decreased. Beta levels have remained well below the Public Health Service Drinking Water Standard of 1,000 pc/l or $\mu\mu c/l$ (26).

Alpha levels reflect largely the activity added by uranium and thorium daughters. The waters of the United States can be characterized in a general way with respect to gross alpha radioactivity content. Gross alpha levels average less than 1 pc/l in east coast, Appalachian, Great Lakes, and Pacific Northwest States. On the Colorado Plateau, and along the eastern slope of the Rocky Mountains, natural radioactivity, principally from mineral deposits, results in average concentrations of about 20 pc/l.

Gross levels are most informative in ascertaining long-term trends or changes in water quality. By themselves, however, they are of limited value in assessing radiation exposure. Where gross results are consistently over the maximum permissible concentrations for mixed fission products, the identity of the specific radionuclides involved must be established.

Because of its significance in the environment, the concentration of strontium 90 in the total solids is also reported. In water year 1963, strontium 90 levels ranged from 0.4 to 11.3 pc/l. The national average reached a high of 3.8 pc/l during the fourth quarter (July, August, September 1963). Highest levels were in the north-central area of the coterminous United States where the average was approximately 6 pc/l for this quarter. All averages were less than the limit (10 pc/l) specified in the Public Health Service Drinking Water Standards (26). The levels of strontium 90 activity in waters of the United States since the first quarter of the 1959 calendar year are presented graphically in figure 2.

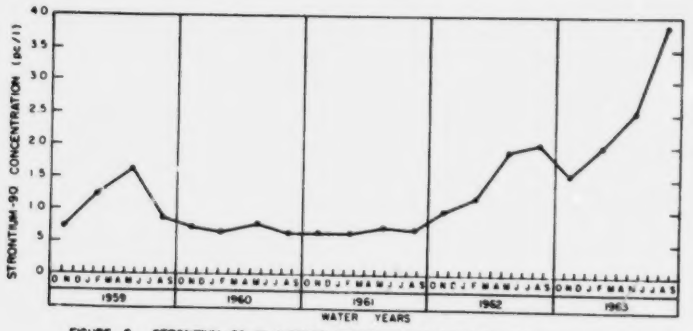


FIGURE 2. STRONTIUM-90 IN SURFACE WATER OF THE UNITED STATES

Plankton Populations

Geographical distribution of algae and other planktonic organisms are influenced by geologic and climatic factors, and result in distinctive plankton populations in different areas. Within each region, population changes are directly related to temperature, and the nature and concentration of organic and mineral substances which enter the aquatic environment. These substances may come from domestic sewage, industrial wastes, runoff from agricultural lands, irrigation discharges, or native rocks and soils. They may be basic nutrients, highly toxic, or metabolically inert. Planktonic organisms differ greatly in their sensitivity to the nutrient and toxic substances which are present. Some thrive only in water which is relatively free of nutrients while others multiply rapidly in water which has been greatly enriched. Large numbers of tolerant algae usually develop in waters containing abundant supplies of inorganic nitrogen and phosphorus resulting from the mineralization of domestic sewage. These nuisance populations may clog filters in municipal water plants, and produce objectional tastes and odors.

On the other hand, plankton populations may be eradicated by the introduction of toxic organic or mineral wastes. This is not desirable because some plankton organisms play essential roles in providing food and oxygen for higher forms of aquatic life, and in cleansing polluted waters.

Beginning at low nutrient levels, progressive enrichment of waters results in an increase in the variety and abundance of the plankton. However, as higher levels of enrichment are attained, the increase in total numbers of organisms is accompanied by a decrease in the number of kinds of organisms. This change is typical in populations which have been subjected to the wide spectrum of substances being introduced into

surface water in ever increasing amounts. Plankton counts, which provide information concerning the variety and abundance ot organisms, are useful in detecting changes in the concentration of organic and mineral substances which enter water supplies.

METHODS OF ANALYSIS

Plankton samples are collected semimonthly at each station. A sample consists of 3 liters of raw water taken directly from the stream or from a treatment plant intake. Preservation is effected at the time of collection by the use of 30 ppm merthiolate.

Three types of analyses are performed:

1. Rotifers, crustacea, and other micro invertebrates are removed from a 1-liter aliquot of the sample by settling 24 hours. The sediment is placed in a special slide, 80 x 50 x 2 mm., and the organisms are enumerated under a compound microscope at 100× magnification. The counts are reported as organisms per liter.

2. A "total live algae" count is obtained from 1 milliliter of the sample by scanning two 50-mm. strips on a Sedgwick-Rafter slide using 200× magnification and a Whipple micrometer disc. An appropriate correction factor is used to convert the counts to units per milliliter. Each single cell or natural aggregate of cells (colony) occupying up to 300 square microns (μ^2) is counted as 1 unit. Large colonies are enumerated according to a modified areal-unit method in which aggregates occupying 300–1,000μ^2 are counted as 2 units, those occupying 1,000–2,500μ^2 as 3 units, those 2500–5000μ^2 as 4 units, and those over 5,000μ^2 as 5 units. About 95 percent of cell aggregates fall into size 1 or 2.

3. Identification and proportional census of diatom species are done from sediment obtained by settling 1 liter of the sample 48 hours. A small aliquot of the sediment is placed on a No. 1 coverglass and dried on a warming table. The sediment is ashed on the coverglass by heating on a hotplate, and permanent slides are made with hyrax mounting medium. Counts are made with 90× apochromatic oil immersion objectives and 10× oculars containing a Whipple micrometer disc. Random strip counts are made until the total number of units reaches 200 to 300. The same areal units are used as described for Sedgwick-Rafter counting.

Organic Chemicals

The Nation's water resources continue to receive increasing quantities of organic contaminants. Since 1940 the chemical industry, particularly in the manufacture of synthetic and petrochemicals, has experienced an enormous expansion that shows every sign of continuing. Each year millions of pounds of synthetic detergents, insecticides, herbicides, and similar domestic products find their way into our streams from household sewers, industrial waste discharges, and land runoff.

Effective and economical treatment methods for most of the complex organic materials remain to be developed. Even where treatment exists, residues may remain in sufficient quantity to cause water damage. These stable residues persist through sewage treatment, biological and chemical action of the stream, and water treatment processes, and finally reach the consumer in drinking water.

The presence of some of these materials, even at concentrations considerably less than 1 part per million, may impair water quality, most noticably in production of tastes and odors. Fishflesh tainting, also quickly noticed by the consumer, is another damage. Effects on water treatment, many of which are ill-defined at present, and impairment of water quality for industrial uses are being reported with increasing frequency. Essentially nothing is known of the possible immediate or long-term effects of these materials on human health. Such information is urgently needed.

The usual sanitary analyses are not effective in measuring these newer organic contaminants. Yet it is essential to know something of their concentrations and character. A method known as the "Carbon Adsorption Technique," developed by the Public Health Service, permits the concentration of these organic compounds from a large volume of water. Elution of the adsorbed materials with organic solvents, followed by chemical separation and testing, provides useful information concerning organic pollution and for assaying river systems for these substances.

Following continuous flow of about 5,000 gallons of water through the carbon adsorption column over a 7- to 10-day period at 0.5 gpm, material on the carbon adsorption column is extracted with two solvents, chloroform and alcohol. The residues are weighed. The concentration of these materials in the water sampled is then computed. See Explanation of Analytical Data, page 21.

CHLOROFORM EXTRACTS

The organic residue recovered from the carbon adsorption column by chloroform is very complex. It is desirable to separate the crude extract into certain broad chemical classes, and this can be done on the basis of solubility differences. The various classes or groups and their general significance are discussed briefly below.

Ether Insolubles

This group is usually a brown, humuslike powder, apparently composed to a large extent of carboxylic acids, ketones, and alcohols of complicated structure. Origin of the group, which is an indicator of "old" pollution, is believed to be partially oxidized sewage and industrial wastes. For example, the Ohio River at Cincinnati has been exposed to much industrial and sewage pollution, and hence large amounts of ether insoluble materials are found. Streams with little or no pollution history have little or no ether insolubles. Chloroform extracts contain from 0 to 30 percent of ether insoluble material.

Water Solubles

These substances are largely acidic and undistillable at moderate temperatures, but their solubility in ether indicates that the molecules are smaller and probably simpler than the ether-solubles. On the other hand, their water solubility practically requires the presence of several functional groups, such as hydroxy-acid, keto-acid, and keto-alcohol. Such compounds probably originate from partial oxidation of hydrocarbons or they may be natural substances. They have very little odor. These materials usually make up 10 to 20 percent of the total extract.

Weak Acids

This group is characterized by being removed from ether solution with sodium hydroxide but not with sodium bicarbonate. Phenols are the best known weak acids, and if present in the water, appear in this group. Other weakly acidic compounds include certain enols, imides, sulfonamides, and some sulfur compounds. This group of materials also occurs in nature. The weak acids are odorous, and commonly constitute 5 to 20 percent of the chloroform extract.

Strong Acids

These acids are usually carboxylic acids such as acetic, benzoic, salicylic or butyric. Although classified as strong in reference to carbonic acid, they are actually weak when compared with a mineral acid, such as sulfuric. Many of the compounds are used industrially, but may also be produced by natural processes, such as fermentation. Some of the materials are highly odorous. This fraction makes up from 5 to 20 percent of the total. The significance of the strong acids can be interpreted only in the light of stream pollution conditions.

Bases

These compounds are organic amines. Such materials as aniline and pyridine are amines of commerce. Lower amines may occur as a result of decomposition. Although odorous, the low concentrations found are not likely to cause objectionable conditions. However, in the case of specific amine-containing wastes the compounds can be of considerable significance. Generally, only 1 or 2 percent of the total extract is made up of the bases.

Neutrals

This group frequently constitutes the major portion of the chloroform extract. Neither basic nor acidic, the materials are less reactive and tend to persist in streams longer than many other types. Hydrocarbons, aldehydes, ketones, esters, and ethers are examples of neutral materials. The group lends itself to further fractionation by means of chromatographic separation into aliphatic, aromatic, and oxygenated subgroups:

Aliphatics: This portion represents petroleum type hydrocarbons in a considerable state of purity, and is usually made up of mineral oil type of material. The percentage of aliphatics present yields important information about the possible source of pollution, since petroleum is the most likely source.

Aromatics: These are principally the coal tar hydrocarbons such as benzene, toluene, and a host of others, and their presence in any significant amount is a reliable indication of industrial pollution. Further, the materials can frequently be identified by infrared spectrophotometry. Some aromatic compounds which have been found in our rivers—and in our drinking water—include DDT, aldrin, endrin, dieldrin, phyenyl ether, orthonitrochlorobenzene, pyridine, phenol, and others. The materials are highly odorous, and may also be toxic. Their appearance in any quantity as pollutants should receive careful evaluation.

Oxygenated compounds (Oxys): These are the neutral compounds containing oxygen, such as aldehydes, ketones, and esters. They may have originated by direct discharge or may represent oxidation products from both natural and industrial materials. They help to indicate the "age" of the pollution, since pollution exposed to oxidation forces for a long time would be expected to contain large amounts of oxys. The oxy materials are odorous.

Losses

Manipulative losses inherent in this type of separation may amount to 10 to 15 percent. Losses greater than this may indicate that volatile components were lost from the sample. Such volatiles may have significance as pollutants.

ALCOHOL EXTRACTS

The alcohol extractables generally consist of materials more polar than the chloroform extractables. They often contain synthetic detergents, carboxylic acids and humic materials which may originate naturally or from oxidized products of domestic and industrial wastes. These classes of substances are not quantitatively recovered by the alcohol extraction. For example, this extraction recovers only 20 to 30 percent of the synthetic detergents present. On waters of mixed industrial and domestic pollution, the chloroform and alcohol extractables may be about equal. On some streams where the industrial pollution is rather low and much natural pollution or sewage is present, the alcohol extractables may exceed the chloroform extractables by a factor of 4 to 6.

The alcohol extract is usually only partially soluble in water and most ordinary solvents. Very little further chemical separation of this material is currently practical. However, tests have revealed that synthetic detergents may make up 1 to 12 percent of the alcohol extract.

OTHER TESTS

Infrared spectra are routinely run on the total chloroform and alcohol extracts as well as the neutral, aliphatic, aromatic and oxygenated groups which are usually the most significant. Spectra of other groups are obtained when there is an indication that they may be significant. These spectra reveal something of the chemical structure of the materials, indicate differences and in certain instances provide a definite identification. In the case of the alcohol extracts, the infrared spectra will indicate the presence of synthetic detergents if the materials constitute a significant portion.

Thin layer chromatography has been applied successfully to the resolution of the aromatic and basic fractions of CCE. Gas chromatographic equipment with flame ionization, electron-capture and microcoulometric detectors have also been used freely in the identification of specific substances.

COMPOSITE ANALYSIS

Samples from certain locations have been selected for analysis on a quarterly composite basis. Stations that have collected at least 12 samples in a nearly consecutive manner and averaged 100 ppb. or less of chloroform extractables are selected for such analysis when certain other conditions are met. However, samples falling in this category are analyzed individually when the recovery of the chloroform extract is exceptionally high and/or it is unusual in its infrared spectrum or some other physical characteristic.

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SPECIFIC IDENTIFICATIONS

Information about specific organic substances which were identified in carbon adsorption samples is given on the second page of the group associated with each station. The increased number of pesticide and other specific compounds identified, as compared to previous years, is partly associated with greater sensitivity in analytical methodology and may be partly a reflection of the increasing usage of these substances in the total environment.

Chemical, Physical, and Bacteriological Examinations

The various biochemical, chemical, physical, and bacteriological examinations generally performed by the participating laboratories are discussed below.

AMMONIA NITROGEN AND CHLORINE DEMAND

The cost of water treatment for domestic use is affected by the consumption of chlorine, with ammonia nitrogen being responsible for a large portion of the chlorine demand. The greater this demand, the more expensive is the treatment. The ammonia may originate from unstabilized domestic pollution, from industrial waste discharges, from run-off containing fertilizers used in farming operations or from all three. The presence of measurable quantities of nitrogen compounds, not necessarily ammonia, is also an indication of the fertility of the stream toward both macro- and micro-biological forms.

COLOR

Color in domestic water supplies is undesirable. Its removal in the water treatment process, whether it be from natural or industrial sources, may require large doses of chemicals and be expensive.

DISSOLVED OXYGEN, BIOCHEMICAL AND CHEMICAL OXYGEN DEMANDS

Biochemical processes, in which aquatic organisms attack and stabilize the organic matter present, require dissolved oxygen. If unstable oxidizable organic matter is present in excess, the organisms will multiply rapidly, consuming the oxygen present in the water, and bring about a foul, septic stream condition. The dissolved oxygen level thus serves to indicate the biochemical activity of the stream. High activity, resulting in low dissolved oxygen levels, will drive out game fish in favor of scavengers. Very low or zero oxygen levels will kill all fish and aquatic organisms dependent on dissolved oxygen for life. Temperature and reaeration rates also affect dissolved oxygen levels.

The 5-day biochemical oxygen demand (BOD) indicates the degree of unstabilized organic pollution from either domestic or industrial sources, to which the stream is being subjected. A significant demand will affect the fish and macroorganism population, and waters carrying a high BOD seldom contain game fish. On the other hand, game fish will thrive in streams in which the oxygen demand has been stabilized, as this condition is usually favorable for the growth of organisms on which fish feed.

The chemical oxygen demand analysis serves to support the findings of the biochemical oxygen demand test. It too may indicate to what extent the waste load of the stream has been stabilized, or it may indicate the presence of organic and inorganic pollution which is not readily oxidized by biological processes. Because the chemical oxygen demand can be determined quickly in comparison to the biochemical oxygen demand, the establishment of a correlation between the two parameters serves to reduce the number of the latter determinations required. The chemical demand results are nearly always higher than the biochemical demand.

TEMPERATURE

Temperature is particularly important to conservation and industry. A few degrees elevation in temperature due to cooling water discharges may seriously limit the capacity of a stream to support fish life. Also, high water temperatures increase the cost of cooling water for

industrial operations. Cooling towers and other equipment for handling cooling water must be engineered to the temperature levels normally encountered.

MINERAL CONSTITUENTS

These determinations include alkalinity, hydrogen-ion concentrations (pH), hardness, chlorides, sulfates, and total dissolved solids. The pH indicates whether water is acidic or alkaline, corrosive or passive. Alkalinity is a measure of the neutralization reserve present, or the extent to which the water can resist a change from an alkaline to an acid condition upon addition of acidic chemicals. This information is important to the water treatment plant operator and to many other water users.

Hardness is not only a measure of the soap consuming property, but is also of importance in the treatment of boiler waters, where removal of hardness is one of the most important functions. Chloride, sulfate, and total dissolved solids add further information on the gross dissolved mineral content carried by the stream. These are of great importance when considering the taste or palatability of water. They are also important when the water is being demineralized for specific industrial processes, since the cost of demineralization is a direct function of the dissolved solids content of the water. In addition, waters of high saline content are less desirable and may at times even be unfit for municipal, irrigation, and other uses.

TURBIDITY

Turbidity of water is due to the suspension of clay, silt, finely divided organic matter, microscopic organisms, and other similar materials. Its presence is of particular importance in water treatment processes and in the propagation of fish and other aquatic life.

COLIFORM ORGANISMS

Information about fecal pollution is essential to water quality measurements. Data on coliform bacteria, used as indicators of pollution, help to point up the trends in the effectiveness of treatment of domestic waste discharges.

The delayed-incubation membrane filter technique is used for the coliform examination, instead of the fermentation tube (MPN) method. The latter necessitates transport of water samples to the Water Quality Section laboratory for examination, with a time lapse between collection and examination that can significantly change their microbial content. Also, some of the many other bacteria present in raw water might overgrow or otherwise inhibit the demonstration of the coliform organisms. In the delayed-incubation membrane filter procedure, the bacteria are filtered out from the fluid samples immediately after collection and the filters sent to the Water Quality Section laboratory on a preservative medium. In the laboratory the membrane filters carrying the bacteria are transferred to a medium selective for coliform organisms, then incubated and counted. The resulting counts approach very closely the actual numbers of coliform bacteria present in the water samples at the time of collection.

Unusual populations of coliform bacteria may mean increased pollution and ensuing loss of water quality. The Public Health Service Water Pollution Surveillance System studies and reports the trends in sewage pollution on streams as indicated by the trends of coliform counts.

Trace Elements and Other Determinations

This year's trace element data differ somewhat from data reported in previous compilations in that the manner of obtaining the data has been modified and the program of elements measured altered. The trace metals measurements are now obtained from a 3.4 meter direct reading spectrograph. Tin, antimony, and bismuth have been discontinued; arsenic, boron, phosphorus, aluminum, and strontium have been added. Increased sensitivity for several elements has been attained, especially zinc, manganese, and beryllium, resulting in fewer indeterminate values.

Twice during the year, 3-month composites of the weekly samples were prepared and subjected to analysis. Examinations covered those elements included in the Public Health Service Drinking Water Standards (*26*), and other metals considered to have possible physiological or

toxicological significance. The ultimate goal of this phase of the program is to provide background data on all elements which may be found in water and which may be of significance in water quality management.

In carrying out the spectrographic examination, the sample is first passed through a membrane filter, .045 micron pore size, to remove all suspended matter. An aliquot of sample is then acidified with redistilled nitric acid and evaporated to a concentration containing 100 mg. of dissolved solids in 5.0 ml. A portion of the prepared sample is placed in a porcelain boat and sparked using a rotating disc, with concentrations of the 19 programed elements measured on the direct reader (*12*).

Waters of low dissolved solids content can be concentrated to a greater degree than those having a high dissolved solids content, thus accounting for the variable sensitivity shown in the tabulations. Values followed by an asterisk (*) show the limits of sensitivity at which the test was performed and indicate that the ion being measured was not detected at that level.

It is known that trace concentrations of some ions are subject to precipitation and adsorption on container surfaces during storage. This applies particularly to iron and manganese which are subject to oxidation. Hence, all the values reported by the spectrographic method represent the quantity of metal in solution at the time of analysis to within about 10 percent.

The measurement of sodium and potassium is performed using a flame procedure. Fluoride is determined with the SPADNS reagent using the method described by Bellack and Schouboe (*3*). Boron, previously measured by the curcumin procedure, is now reported from the spectrograph. Measurement of selenium has been eliminated due to the general absence of this element from the samples examined.

The concentrations of surface active agents, reported as alkyl benzene sulfonate (ABS), in the Nation's surface waters is reported for the first time on a number of selected stations. As the capability of determining this poilutant increases, efforts will be made to include all sampling points in the Surveillance System. The data presented here were obtained using a modification of the Standard Methods methylene blue procedure on an automatic analyzer.

The Benthos

Animals and plants that live in or on the bottom substrata of lakes and streams are known as the benthos. This biological community includes such common animals as immature insects, worms, clams, snails, and crustacea. The benthic populations found on a stream bottom are largely determined by the type of substrate. Bottoms consisting of soft silty sediments are normally inhabited by animals that are able to burrow into the sediments and feed on organic detritus in the sediments. These include worms, clams, and certain insect larvae. The number of species is usually small in these habitats. Shallow streams with shoals, rapids, and riffles have more available niches for animals to occupy and the normal benthic fauna usually includes a large variety of organisms.

The benthic populations provide a basic indicator of general water quality. Whereas the plankton organisms move downstream with the current, and fish are able to migrate considerable distances, the benthos is a population relatively fixed on the bottom and the animals are subject to the water flowing over them. The benthic populations will therefore be influenced by the quality of the water.

The animals that make up the benthos have various life cycles. Insects may exist as aquatic larvae living in the bottom for as long as 2 years. They then emerge as adults and mate. The female deposits fertilized eggs into the stream. Some of the class produce young which attach themselves to fish. Some of the worms reproduce asexually. An analysis of the age structure of certain forms in the benthos may provide information on past conditions of the water.

Under conditions of good water quality the benthos should include a variety of species with no one species being present in excessive numbers. If the water should become degraded, certain species in the population, intolerant of the changed environment, will die out; and as the water quality deteriorates, increased numbers of species in the benthos will be eliminated. The one or more species that survive may be able to develop very large populations. Toxic materials in the water or deposited on the bottom may effectively eliminate all bottom life.

At each station where bottom samples are taken an attempt is made to find areas of suitable substrate. From these areas, where pos-

sible, a series of at least six quantitative samples is taken by means of suitable dredges or samplers. In riffles the Surber squarefoot sampler is used. In deep rivers the Ekman or Peterson dredge is used (see Standard Methods, for the Examination of Water and Wastewater, 11th edition, pp. 572–582) (22). A general qualitative collection of invertebrate life is usually made at all stations.

The bottom materials are screened in the field using a screen with 28 meshes to the inch. The concentrated sample is preserved in alcohol and returned to the laboratory.

In the laboratory the sample is transferred to pans and the macroscopic organisms are separated from the sediment and detritus. The animals are then identified as near to species as possible, enumerated, and weighed. Specimens are preserved and retained for future reference.

During this year benthos data were gathered for stations in the Ohio and Tennessee River basins only and are presented with the descriptive material for the appropriate stations. A supplemental analysis of these data will be published separately.

Fish Populations

Fish are a biological end product of the aquatic environment. They are an important source of food, and sport fishing is one of our leading forms of recreation. The maintenance of fish life has been recognized by the Congress, and by States which have protective pollution control legislation, as an important and legitimate use of our Nation's waterways. In other words, in measuring fish populations at Surveillance System stations, we are not measuring a parameter that affects a water use as in the case of other measurements presented in this compilation, but rather a unique parameter that is in itself considered a beneficial water use.

The water quality requirements and tolerance of aquatic life to different types of contaminants vary tremendously. It is this variability in response which makes living aquatic organisms usable indicators of environmental disturbance. Fish require water relatively high in dissolved oxygen, and are intolerant of many chemical and physical contaminants resulting from agricultural, industrial and mining practices. However, the tolerance of different species varies, and man-induced changes of the environment often affect one species more than another, producing imbalanced populations which quite often favor the species less desirable economically.

Moderate amounts of putrescible wastes may enrich the habitat, resulting in great increases in standing crops of fish present. However, under such conditions, the more tolerant and adaptable species may comprise a disproportionate share of the total population, and very sensitive species may be eliminated altogether. The effect of toxic wastes may vary from complete elimination of populations to a reduction in reproductive capacity, growth and resistance to disease and parasitism.

Fish kills are a spectacular and obvious indication that an abrupt change has taken place in the environment. However, because of high mobility resulting in rapid recruitment, the fish population in a river or stream may return to normal levels within a very short time after a kill.

Chronic pollution, to which the fish population must adjust over a period of time, will be reflected in the kinds and relative abundance of the fish species present. In addition to the species composition, the condition of the fish, their growth, reproductive success and certainly their palatability are factors of considerable importance in evaluating the suitability of a body of water for supporting usable stocks of fish.

During the current water year, data on fish populations were gathered for some stations in the Ohio and Tennessee River basins only, and are presented in tables in volume 5 for the appropriate stations.

Fish samples at these stations were collected primarily with rotenone and with an electrofishing device. Five percent emulsified rotenone was applied at suitable sites, where an area of 1 to 3 acres could be blocked off with nets during the rotenoning operation. Such sites were usually in the form of small coves along the shoreline, the mouths of small tributaries, or behind the partial enclosure created by navigational lock walls. An electrical shocking device was used along the shoreline both during the day and at night. In a few cases, samples were also collected with trammel nets and with short, 25-foot haul seines. Sampling with nets and seines was limited because of the paucity of habitat in large rivers which is suitable for using these types of gear.

With each method used sufficient sampling was done to collect as many species present as possible, and to obtain a measure of the relative abundance and size distribution of the various species. Every type of fishing gear is somewhat selective, and the data obtained may not be representative of the actual population composition present in the river at the time of sampling. However, the data obtained by a given method are quantitatively comparable and may be used to evaluate changes in the population composition resulting from natural and man-induced changes in the habitat. Comparisons should be based on samples collected with the same gear, during the same season of the year, and under similar conditions of stream flow and water temperature. These data will be particularly useful in determining the impact of changes in water quality on the fish populations of the Nation's rivers over long periods of time.

For convenience of comparison, the fish in the tables are grouped into six major categories based on food habits and methods of feeding:

I. Large, sight feeding carnivores that feed on other fish. This group includes most game species.

II. Species that feed primarily on insects. This group provides important forage for species in group I.

III. Species that feed primarily on plankton and algae. These also provide important forage for group I species.

IV. Species that feed primarily on mollusks.

V. Omnivores that feed indiscriminately on plant and animal matter from the bottom.

VI. Scavengers that take any available food. Some of the species in this group may sometimes act as predators. The group also includes many important food fish, and species that are tolerant of degraded conditions.

Because foods and feeding habits vary with size, age, and availability of food, there may be considerable overlap between groups. The species listed were grouped according to available literature regarding the main foods of adult specimens of each species.

In the field the total length of the fish was routinely measured to the nearest inch class on a one-half inch interval. Thus a fish in the 5-inch class would measure from 4.5 inches to slightly under 5.5 inches. If the end of the tail touched the dividing line between two length classes, the fish was included in the higher classification. The percent total number and weight are carried to the nearest one-tenth of 1 percent in the tables. The one-tenth of 1 percent was arbitrarily selected for purposes of tabulation, and does not imply such a high level of sampling accuracy.

The fish are listed by common names in the tables according to American Fisheries Society Special Publication No. 2 (1960), A List of the Common and Scientific Names of Fishes From the United States and Canada, Second edition (*1*).

Stream Flow

Stream flow data have a most important role in the utilization of water quality parameters such as are included in this report. For this reason, average daily flow records are reported for most of the sampling stations in the System.

All flow data included in this compilation are *provisional* data furnished by the agencies credited, and are subject to revision by such agencies prior to any final publication. With the exceptions mentioned, the flows are given as furnished to the Public Health Service.

The data were generally furnished in units of cubic feet per second. In general only the first three digits were considered significant. Because of machine limitations the data are reported here in thousand cubic feet per second. Even though three zeros may appear after the decimal, no artificial accuracy of measurement is implied. Only the first three digits should be considered significant. There are two exceptions:

(1) When the flow was over 1 million cubic feet per second, the first four digits are reported, and (2) at times when the Rio Grande flows were extremely low, the data were reported to tenths of a cubic foot per second. These figures are published showing 4 decimal places.

Flow data for sampling stations on the rivers of the Great Lakes system are reported as the monthly mean flow, as computed by the U.S. Lake Survey. In certain other rivers, flow data were computed by the Public Health Service from information supplied by the gaging agency. The methods of computations are shown as footnotes to the data for the applicable stations.

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Explanation of Analytical Data

RADIOACTIVITY DETERMINATIONS

In evaluating radioactivity data it should be noted that the reported errors represent counting errors only and the reported values are subject to other errors commonly associated with gross radioactivity analysis. (See Reference 22.)

A dash (—) in the count column signifies that no determination was made. An asterisk (*) following date of sample indicates that determinations are for composites of two or more samples taken on and before the date shown.

Strontium 90 determinations are reported in micro-microcuries per liter as measured from total solids in the sample composited for the quarter. A dash (—) indicates that no determination was made in that period.

PLANKTON POPULATION

Plankton data are reported on two pages. The first page lists the population size of various groups of algae. A coded number shows the ten most abundant genera of algae and their count level. Code numbers used are identified on page 18. Blank spaces on the data sheets signify that counts of other genera were below a level of 150 per ml. The second page of plankton data lists the four dominant diatom species and their occurrence as a percent of the total diatom population. The percent of occurrence of all other diatom species is shown in the next column. Identification codes of species are given on page 19.

The detectable numbers per ml. of fungi, sheathed bacteria and protozoa are shown in the next two columns. The rotifer and crustacea totals per liter are listed together with the genera where these occurred at a count level of five or more per liter for rotifers and three or more per liter for crustacea. Nematode and miscellaneous animal form counts per liter appear in the last two columns.

A dash (—) indicates that no analysis was made. A zero count of each group is indicated by "0". Blank spaces under abundance and dominance columns indicate that the populations were too few to be included or were absent. Coding for abundant genera of rotifer and crustacea population levels are presented on page 20.

PLANKTON POPULATION

Identification Codes of Algae Genera and Count Levels of Most Abundant Genera

KEY TO COUNT LEVEL (per ml.)

1 150 to 300
2 301 to 600
3 601 to 1,200
4 1,201 to 2,400
5 2,401 to 4,800
6 4,801 to 9,600
7 9,601 to 19,200
8 19,201 to 38,400
9 38,401 and over

Code to ALGAE GENERA (Producers)

Blue-green Algae

01 Agmenellum (Merismopedia)
02 Anacystis (Microcystis)
03 Anacystis
04 Coccochloris
05 Gomphosphaeria
06, 07, 08 Reserve
09 Other genus
10 Other genus

Filamentous blue-greens

11 Anabaena
12 Aphanizomenon
13 Arthrospira
14 Lyngbya
15 Oscillatoria
16 Phormidium
17 Raphidiopsis
18 Spirulina
19, 20, 21 Reserve
22 Other genus
23 Other genus

Coccoid green algae

24 Actinastrum
25 Ankistrodesmus
26 Chlorella-type
27 Chlorococcum
28 Closterium
29 Coelastrum
30 Crucigenia
31 Dictyosphaerium
32 Golenkinia
33 Lagerheimia
34 Micractinium
35 Oocystis
36 Palmellococcus
37 Pediastrum
38 Scenedesmus
39 Staurastrum
40 Tetradesmus
41 Tetrastrum
42, 43 Reserve
44 Other genus
45 Other genus

Filamentous green algae

46 Cladophora
47 Stichococcus
48 Stigeoclonium
49 Reserve
50 Other genus

Green flagellates

51 Chlamydomonas including Carteria
52 Euglena
53 Lepocinclis
54 Pandorina
55 Phacotus
56 Phacus
57 Trachelomonas
58 Reserve
59 Other genus

Other pigmented flagellates

60 Chromulina
61 Dinobryon
62 Gymnodinium
63 Peridinium
64 Reserve
65 Other genus

Diatoms (with chromatophores)

Centric

66 Biddulphia
67 Coscinodiscus
68 Cyclotella
69 Melosira
70 Rhizosolenia
71 Stephanodiscus
72 Other genus

Pennate

73 Achnanthes
74 Amphiprora
75 Amphora
76 Anomoeoneis
77 Asterionella
78 Caloneis
79 Cocconeis
80 Cymatopleura
81 Cymbella
82 Diatoma
83 Diploneis
84 Fragilaria
85 Gomphonema
86 Gyrosigma
87 Navicula
88 Nitzschia
89 Pleurosigma
90 Rhoicosphenia
91 Surirella
92 Synedra
93 Tabellaria
94, 95, 96 Reserve
97 Other genus
98 Other genus
99 Other genus

PLANKTON POPULATION

Identification Code for Diatom Species

No.	Species
01	Achnanthes lanceolata
02	Achnanthes minutissima
03	Achnanthes sp.
04	Amphiprora paludosa
05	Amphiprora sp.
06	Amphora ovalis
07	Amphora sp.
08	Anomoeoneis exilis
09	Asterionella formosa
10	Bacillaria paradoxa
11	Biddulphia laevis
12	Caloneis amphisbaena
13	Caloneis sp.
14	Ceratoneis arcus
15	Cocconeis pediculus
16	Cocconeis placentula
17	Cocconeis sp.
18	Coscinodiscus rothii
19	Coscinodiscus (brackish)
20	Coscinodiscus sp.
21	Cymatopleura solea
22	Cymatosira belgica
23	Cyclotella atomus
24	Cyclotella comta
25	Cyclotella kutzingiana
26	Cyclotella meneghiniana
27	Cyclotella pseudostelligera
28	Cyclotella stelligera
29	Cyclotella striata
30	Cyclotella sp.
31	Cymbella ventricosa
32	Cymbella tumida
33	Cymbella sp.
34	Denticula sp.
35	Diatoma elongatum
36	Diatoma vulgare
37	Diatoma sp.
38	Diploneis smithii
39	Diploneis sp.
40	Epithemia turgida
41	Epithemia sorex
42	Epithemia sp.
43	Eunotia sp. (first)
44	Eunotia sp. (second)
45	Fragilaria capucina
46	Fragilaria construens
47	Fragilaria crotonensis
48	Fragilaria pinnata
49	Fragilaria sp.
50	Frustulia sp.
51	Gomphonema olivaceum
52	Gomphonema sp.
53	Gyrosigma kutzingii
54	Gyrosigma sp.
55	Hantzchia amphioxys
56	Melosira ambigua
57	Melosira distans var. alpigena
58	Melosira granulata
59	Melosira binderana
60	Melosira islandica
61	Melosira italica
62	Melosira varians
63	Meridion circulare
64	Navicula cryptocephala
65	Navicula sp. (first)
66	Navicula sp. (second)
67	Nitzschia acicularis
68	Nitzschia tryblionella
69	Nitzschia denticula
70	Nitzschia (Lancelolatae group)
71	Nitzschia sp. (first)
72	Nitzschia sp. (second)
73	Opephora martyi
74	Pinnularia sp.
75	Pleurosigma delicatulum
76	Rhoicosphenia curvata
77	Rhizosolenia eriensis
78	Rhopalodia gibba
79	Rhopalodia sp.
80	Stephanodiscus astraea var. minutula
81	Stephanodiscus dubius
82	Stephanodiscus hantzschii
83	Stephanodiscus niagarae
84	Stephanodiscus sp.
85	Surirella brightwelli
86	Surirella ovata
87	Surirella striatula
88	Surirella sp.
89	Synedra acus
90	Synedra pulchella
91	Synedra nana
92	Synedra ulna
93	Synedra vaucheriae
94	Synedra sp.
95	Tabellaria fenestrata
96	Tabellaria flocculosa
97	Any entity not found above (first)
98	Any entity not found above (second)
99	Reserved for future entity
xx	Insignificant or population inadequate

PLANKTON POPULATION

Identification Codes of Microinvertebrate Genera and Count Levels of Most Abundant Genera

Genera of ROTIFERS
Key to counts per liter

1 5 to 10
2 11 to 20
3 21 to 40
4 41 to 80
5 81 to 160
6 161 to 320
7 321 to 640
8 641 to 1,680
9 1,681 and over

Genera of CRUSTACEA
Key to counts per liter

1 3 to 5
2 6 to 10
3 11 to 20
4 21 to 40
5 41 and over

Code to MICROINVERTEBRATES

Rotifers

01 Asplanchna
02 Brachionus (also Platyias)
03 Collotheca
04 Cephalodella
05 Chromogaster
06 Euchlanis
07 Filinia
08 Gastropus
09 Hexarthra (also Pedalia)
10 Kellicottia
11 Keratella
12 Lepadella
13 Monostyla (also Lecane)
14 Notholca
15 Philodina and similar contracted bdelloids
16 Ploesoma
17 Polyarthra
18 Pompholyx
19 Proales
20 Rotaria
21 Synchaeta
22 Trichocerca
23 to 45 Reserve
46 Other genus
47 Other genus
48 Other genus
49 Other genus

Cladocerans

50 Nauplii
51 Bosmina and related genera
52 Daphnia and related genera
53 Moina
54 Polyphemus
55 to 72 Reserve
73 Other genus
74 Other genus
75 Other genus

Copepods

76 Cyclops,Euclops, and Paracyclops
77 Diaptomus
78 to 97 Reserve
98 Other genus
99 Other genus

Blank—Insignificant or population inadequate

ORGANIC CHEMICALS

Although units of concentration may be assigned to the values reported herein (µg/l or parts per billion), it is essential that the user of these data consider additional associated information. Introspective examination of the data reported herein has indicated that comparison of concentration values obtained from samples of similar gallonage are more valid than samples of widely differing gallonage. In addition, recent experimental researches have shown that lower flow rates and lower sample volumes than those employed (5,000 gallons at 0.5 gpm) are substantially more efficient and should produce relatively higher concentration values with this method. The first in a series of changes designed to increase sampling efficiency is already underway at Water Pollution Surveillance System stations.

Concentration values reported for specific substances are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE. In light of an unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.

Zeros when reported have been entered. A dash indicates that the respective results were not reported. An asterisk in the column showing end of sample date indicates that the determinations are for composited samples taken on and before the date shown. The extent of compositing can be determined by examining the gallons filtered, which is the sum of the applicable individual samples immediately above it.

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

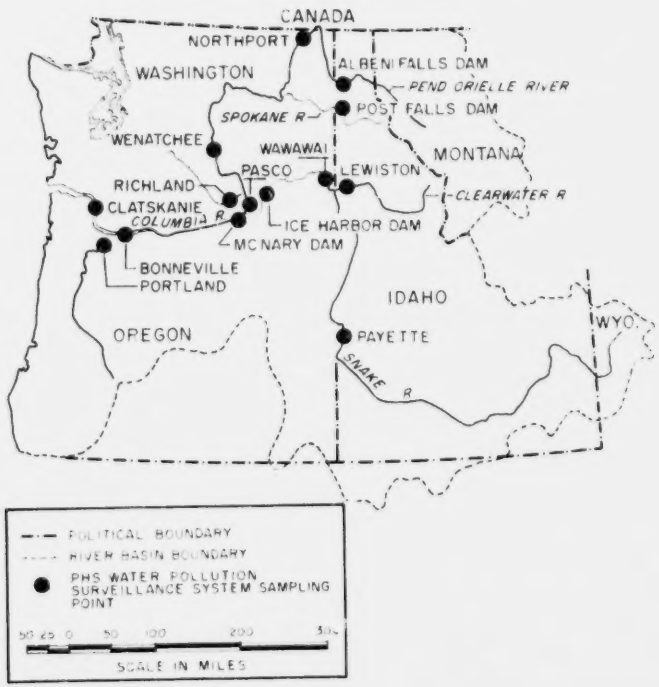
The data entered in each column are as reported. Concentrations of alkalinity and hardness are reported in milligrams per liter as $CaCO_3$. A dash signifies that the particular test was not performed. Zeroes when meaningful have been entered. An asterisk preceding a number should be read as "less than" the number following it.

TRACE ELEMENTS AND OTHER DETERMINATIONS

For a discussion of the sensitivity limits of the determinations performed with spectrographic methods, see page 11.

BASIN 13

PACIFIC NORTHWEST



The Pacific Northwest Basin includes the Columbia River system and the small Pacific Coast drainage basins along the western flanks of the Cascade and Coast Ranges in Oregon and Washington. At present, only the Columbia Basin is included within the Public Health Service Water Pollution Surveillance System.

The drainage basin totals about 259,000 square miles, of which 220,000 lie in the United States, and embraces most of Washington and Oregon, nearly all of Idaho, western Montana, and small portions of Wyoming, Utah, and Nevada.

The *Columbia River* originates in Columbia Lake, in south eastern British Columbia, Canada. It flows 190 miles northwest, thence generally south for about 270 miles to the international boundary. The river then continues for about 750 miles to its mouth, where it enters the Pacific Ocean. The fall from source to tidewater is about 2,700 feet. Many of the tributaries, however, have even greater elevation drops between source and mouth, varying in some instances from 3,000 to 6,000 feet.

The principal tributary is the Snake River, draining an area covering approximately the southeastern half of the United States portion of the basin. Other major tributaries include the Pend Oreille, Spokane, Yakima, and Willamette Rivers. Numerous smaller tributaries also enter the Columbia River throughout its length.

The Cascade Mountain Range lies a short distance inland from the Pacific Coast. Two hundred to 300 miles east of the Cascades is the main range of the northern Rocky Mountains. Ninety-one percent of the land area of the Columbia River Basin, accounting for 75 percent of the runoff, lies in between.

The intervening plateau includes several low mountain ranges and rolling hills, with very steep and precipitous canyons in many places. Much of this area is composed of enormous sheets of horizontal lava flows, covered with surface materials suitable for a variety of agricultural purposes. Nearly all of the interior lands suitable for cultivation are semiarid or near-deserts.

The lower, drier mountain slopes and the dry, interior plateaus are covered by sagebrush and other desert vegetation. The surrounding humid mountains are covered with forests of varying types and

densities, and average precipitation varies from about 40 inches annually in the valleys to 100 inches or more in the mountain areas. Temperatures vary from about 10° to 100° F. along the coast and from minus 50° to plus 120° F. in the inland areas.

Willamette River—This river rises in southwest Oregon and flows northward 300 miles to its confluence with the Columbia River at Portland. It is navigable to Eugene, 178 miles upstream. The Willamette drains the most heavily populated part of Oregon. Agriculture, food processing, and lumbering operations are the principal economic activities.

Snake River—This stream is the chief tributary to the Columbia River. It rises in Yellowstone National Park and flows for about 1,000 miles before joining the Columbia near Pasco, Wash. This stream has cut a canyon which reaches a depth of 5,500 feet. The major population centers of Idaho are located along this stream and both private and Federal irrigation projects are active.

Yakima River—This stream rises on the east slope of the Cascade Range and flows 203 miles to the Columbia. Extensive use is made of this stream for irrigation and hydroelectric power.

Spokane River—This river originates below Coeur d'Alene Lake in western Idaho. The lake receives drainage from Idaho and western Montana. The river flows in a westward course to join the Columbia River. The principal economic activities in this area are lumbering, wheat, fruit, livestock and mining and associated processing.

Pend Oreille River—This stream is headed by a lake and receives drainage from Washington, Idaho, western Montana, and Canada. It flows 119 miles west and northwestward to the Columbia River in Canada. The majority of the drainage basin is covered by natural forests.

Clearwater River—This stream which is tributary to the Snake River drains north central Idaho. A small portion of the drainage is contributed by western Washington. Much of the headwater area is in natural forests and lumbering and lumber mills are the principal economic activity. Some farming is also carried on.

Detailed descriptions of the individual Public Health Service Water Pollution Surveillance System stations, together with additional environmental information is presented with the analytical and flow data.

In general, runoff is high in this basin and mineral concentrations are fairly low except where the water has been used for irrigation.

Phytoplankton counts at stations in this basin are generally less than 5,000/milliliter, except at Payette, Idaho, on the Snake River where summer maxima exceed 40,000/milliliter. It is interesting to note that Payette is the only station in the basin at which centric diatoms have a wide margin of dominance. Summer pulses of coccoid green populations contribute substantially to the higher phytoplankton counts at this station. Water hardness and the concentration of dissolved phosphate are greater at this station than in the basin at large, and may be contributing environmental factors.

The phytoplankton of the basin consists largely of diatoms. The more abundant pennate diatoms include *Asterionella formosa, Fragilaria crotonensis, Tabellaria fenestrata, Diatoma spp.*, and *Synedra spp.* Dominant centric diatoms include *Stephanodiscus hantzschii, Melosira ambigua*, and *Melosira granulata*.

Rotifer populations of 500/liter occur on the lower Columbia, but the numbers decrease to low levels upstream and in tributaries.

CLEARWATER RIVER AT LEWISTON, IDAHO

The Clearwater River is monitored by the Water Pollution Surveillance System approximately two miles above its confluence with the Snake River at the municipal water plant intake. There are minor municipal discharges located at least 40 miles upstream from the station. The nearby area is rather hilly and stock raising is the principal agricultural activity. A Kraft pulp mill is located above the station and utilizes some 30 to 40 million gallons per day of water from the Clearwater River. Wastes from this plant are discharged to the confluence of the Snake and Clearwater Rivers below the Surveillance station. There is a log pond associated with this plant.

Station Location:	Clearwater River At Lewiston, Idaho
Major Basin:	Pacific Northwest
Minor Basin:	Middle and Lower Snake River
Station at:	46°25' Latitude 116°58' Longitude
Miles above mouth:	2
Activation Date:	October 9, 1961
Sampled by:	Lewiston Water Department
Field Analysis by:	Lewiston Water Department
Other Cooperating Agencies:	Idaho Department of Health
Hydrologic Data:	
Nearest pertinent gaging station:	At Spalding, Idaho
Gaging station operated by:	U.S. Geological Survey
Drainage area at gaging station:	9,570 square miles
Period of record:	1910-1913, 1925 to present
Average discharge in record period:	15,250 cfs.

Maximum discharge in record period: 177,000 cfs.

Minimum discharge in record period: 500

Remarks: Small amount of diversion upstream. Flow affected by powerplants on upstream tributary.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l
3- 5-63	0.02
3-19-63	0.02
3-26-63	0.03
4- 2-63	0.04
4- 9-63	0.03
4-16-63	0.02

ELEMENTAL ANALYSES

October to December		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.10	.15
	Na	3.0	4.6
	K	1.3	.7
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	74	49
	Cd	*1	*1
	As	*7	*5
	B	15	13
	P	*2	3
	Fe	22	12
	Mo	*1	*6
	Mn	.4	*.3
	Al	--	16
	Be	*.02	.02
	Cu	37	19
	Ag	*.2	.1
	Ni	41	*1
	Co	*2	*1
	Pb	*2	*1
	Cr	*1	*1
	V	*1	8
	Ba	36	11
	Sr	59	42

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	.4	.2	April to June	—	—
January to March	—	—	July to September	1.2	.2

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE & LOWER SNAKE RIVER

STATION LOCATION CLEARWATER RIVER AT LEWISTON, IDAHO

97

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	16	62	11	7	-	-	-	-	-	-	33	12	27	11	60	16						
10	23	62	12	5	0	1	0	1	0	1	1	12	3	11	4	16						
10	30	62	11	28	0	1	0	0	0	1	2	5	3	6	5	8						
11	6	62	11	30	0	0	0	1	0	1	5	5	9	6	14	8						
11	13	62	12	12	0	0	0	0	0	0	8	6	19	6	27	8						
11	20	62	12	6	0	0	0	0	0	0	13	6	11	5	24	8						
11	27	62	12	28	0	0	0	0	0	0	22	6	17	5	39	8						
12	3	62	1	3	0	1	0	0	0	1	33	7	20	6	53	9						
12	26	62	1	15	0	1	0	0	0	1	4	6	14	6	18	8						
1	15	63	2	19	0	0	0	1	0	1	7	6	13	6	20	8						
2	12	63	3	27*	10	8	0	1	10	8	163	42	26	6	189	42						
3	26	63	4	22*	0	0	0	0	0	0	11	3	50	4	61	5						
4	23	63	5	31*	0	0	0	1	0	1	26	4	24	4	50	6						
5	28	63	6	24*	0	1	0	0	0	1	8	3	14	3	22	4						
6	25	63	7	31*	0	1	0	0	0	1	20	6	15	5	35	8						
7	9	63	9	20*	0	1	0	0	0	1	13	5	11	5	24	7						
8	27	63	10	4*	0	0	1	1	1	1	3	5	17	12	20	13						
9	25	63	11	6*	1	1	0	0	1	1	4	6	9	6	13	8						

PLANKTON POPULATION

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE & LOWER SNAKE RIVER

STATION LOCATION CLEARWATER RIVER AT LEWISTON, IDAHO

97

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	2	62	300	0	0	70	0	0	0	20	180	50	650																		
10	16	62	200	0	0	10	0	10	0	10	140	10	330																		
11	6	62	300	0	0	40	0	0	0	0	250	0	0																		
11	20	62	100	0	0	0	0	0	0	20	60	0	270																		
12	4	62	700	0	0	0	0	0	0	0	660	0	40																		
12	11	62	00	0	0	0	0	0	0	0	30	0	90																		
1	2	63	100	0	0	0	0	0	0	0	80	0	50																		
1	23	63	300	0	80	40	0	0	0	0	150	10	170																		
2	5	63	100	0	0	0	0	0	0	0	70	0	1410																		
2	19	63	100	0	0	0	0	0	40	0	10	40	200																		
3	5	63	100	0	0	0	0	0	0	20	120	0	150																		
3	19	63	200	0	0	0	0	0	0	40	150	0	270																		
4	1	63	100	0	0	0	0	0	0	0	110	20	200																		
4	16	63	300	0	0	0	0	0	0	20	310	20	590																		
5	7	63	100	0	0	0	0	0	0	0	90	0	530																		
5	27	63	300	0	20	0	0	20	0	40	220	110	1100																		
6	4	63	200	0	0	0	0	0	0	0	180	20	290																		
6	18	63	200	0	0	0	0	0	0	20	130	0	0																		
8	6	63	200	30	30	50	30	0	0	0	70	70	420																		
8	20	63	600	0	40	260	0	0	0	40	220	0	20	44	1																
9	2	63	1000	0	0	450	0	90	0	190	240	560	320	38	1																
9	17	63	400	0	0	160	0	20	0	20	180	70	590																		

PLANKTON POPULATION

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE & LOWER SNAKE RIVER

STATION LOCATION CLEARWATER RIVER AT LEWISTON, IDAHO 097

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml)	MICROINVERTEBRATES																							
			1ST		2ND		3RD		4TH					ROTIFERS										CRUSTACEA												
															GENERA AND COUNT LEVEL (See text for Codes)											GENERA AND COUNT LEVEL (See text for Codes)									
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT		PROTOZOA (Genus/class) (Number per ml)	NUMBER PER LITER	1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	1ST		2ND		3RD		NEMATODES (Species/class) Number per liter	OTHER ANIMAL FORMS (Number per liter)
															GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	2	62	92	31	2	17	97	6	14	4	42	-	-	2											0							0	0
10	16	62	92	38	2	9	52	6	14	6	41	-	-	2											0							0	0
11	6	62	92	17	16	10	14	9	97	9	55	-	-	1											0							0	0
11	20	62	92	18	97	13	52	10	16	8	51	60	-	0											0							0	0
12	4	62	92	31	2	12	52	9	41	6	42	-	-	0											0							0	0
12	11	62	2	17	92	13	51	7	41	7	56	50	-	0											0							0	0
1	2	63	92	40	14	18	9	9	51	7	26	-	-	0											0							0	0
1	23	63	1	27	92	15	14	9	51	7	42	-	-	0											0							0	0
2	5	63										-	-	-											-							-	-
2	19	63	92	46	51	6	2	4	36	3	41	-	-	0											0							0	0
3	5	63	14	15	92	13	46	4	31	4	64	-	-	-											-							-	-
3	19	63	14	29	51	12	31	10	2	8	41	-	-	0											0							0	0
4	1	63	14	22	2	14	92	10	31	7	47	-	-	0											0							0	0
4	16	63	2	20	92	16	14	14	51	13	37	-	-	1											0							0	0
5	7	63	92	21	51	14	2	13	14	6	46	-	-	-											-							-	-
5	27	63	14	20	51	13	92	12	2	10	45	-	-	-											-							-	-
6	4	63	2	20	14	19	3[illegible]	15	37	6	40	-	-	-											-							-	-
6	18	63	51	20	2	18	31	15	14	8	39	-	-	-											-							-	-
8	6	63										-	-	-											-							-	-
8	20	63										-	-	-											-							-	-
9	2	63										-	-	-											-							-	-
9	17	63										-	-	-											-							-	-

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE & LOWER SNAKE RIVER

STATION LOCATION CLEARWATER RIVER AT LEWISTON, IDAHO

97

DATE OF SAMPLE					GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES									
BEGINNING			END								NEUTRALS							
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLOROFORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	OXYGENATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	2	62	10	15	2810	170	47	123	0	9	19	3	2	14	0	10	2	1	6
11	6	62	11	19	4470	114	49	65	0	11	15	3	2	10	0	10	4	1	8
12	4	62	12	17	3520	190	50	140	2	11	16	3	2	11	0	9	3	1	8
1	2	63	1	15	2400	169	42	127	-	-	-	-	-	-	-	-	-	-	-
2	7	63	2	17	2450	145	43	102	1	12	12	1	1	10	0	6	4	0	8
3	5	63	3	18	3980	136	49	87	-	-	-	-	-	-	-	-	-	-	-
4	2	63	4	13	3000	147	39	108	1	10	11	2	1	7	1	6	3	1	7
5	7	63	5	20	1620	290	108	182	-	-	-	-	-	-	-	-	-	-	-
6	3	63	6	17	3200	121	55	66	3	15	13	2	1	9	1	7	6	1	10
7	2	63	7	15	2060	223	85	138	-	-	-	-	-	-	-	-	-	-	-
8	9	63	8	20	3870	169	82	87	1	20	27	4	4	17	2	14	8	1	11
9	3	63	9	16	2260	215	74	141	-	-	-	-	-	-	-	-	-	-	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE & LOWER SNAKE RIVER

STATION LOCATION CLEARWATER RIVER AT LEWISTON, IDAHO

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	2	62	15.0	8.2	7.1	-	-	-	-	-	-	29	18	76	47	8	-	80	570
10	9	62	15.0	9.8	7.1	-	-	-	-	-	-	28	20	16	8	2	-	84	2100
10	16	62	11.0	10.2	7.1	-	-	-	-	-	5	22	18	41	20	5	.0	62	1000
10	23	62	12.0	10.4	7.1	-	-	-	-	-	4	32	24	10	*25	6	.0	50	970
10	30	62	11.0	10.4	7.1	-	-	-	-	-	5	20	24	5	*25	3	.0	45	700
11	6	62	12.0	10.4	7.0	-	-	-	-	-	3	26	24	5	*25	3	.0	37	600
11	13	62	9.0	11.4	7.0	-	-	-	-	-	-	-	-	-	-	-	-	-	330
11	20	62	9.0	11.6	7.0	-	-	-	-	-	2	28	24	5	*25	3	.0	44	*33
11	27	62	7.0	12.0	7.1	-	-	-	-	-	2	24	36	10	*25	2	.0	50	530
12	4	62	6.0	13.2	7.1	-	-	-	-	-	5	26	52	5	*25	5	.0	40	500
12	11	62	7.0	12.6	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	330
12	18	62	7.0	11.8	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	800
12	26	62	6.0	14.4	7.6	-	-	-	-	-	5	34	36	-	*25	6	.0	75	1500
1	2	63	6.0	13.6	7.6	-	-	-	-	-	3	52	28	-	*25	4	.0	46	200
1	8	63	6.0	12.8	7.4	-	-	-	-	-	3	28	28	-	*25	5	.0	50	380
1	15	63	4.0	13.8	7.8	-	-	-	-	-	3	28	32	-	*25	3	.0	60	10
1	22	63	4.0	14.0	7.6	-	-	-	-	-	7	32	40	-	*25	5	.0	44	*8
1	29	63	4.0	13.4	7.1	-	-	-	-	-	3	34	28	-	*25	4	.0	61	210
2	5	63	4.0	13.6	7.2	-	-	-	-	-	5	24	36	20	950	3	.0	60	200
2	12	63	4.0	12.8	7.4	-	-	-	-	-	4	24	24	5	*25	3	.0	50	760
2	19	63	6.0	12.2	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	1000
2	26	63	7.0	12.2	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	800
3	5	63	7.0	12.8	7.3	-	-	-	-	-	2	26	48	5	*25	6	.0	47	1000
3	12	63	8.0	12.4	7.2	-	-	-	-	-	3	26	28	5	*25	4	.0	58	-
3	19	63	9.0	12.0	7.4	-	-	-	-	-	3	32	36	5	*25	2	.0	56	3000
3	26	63	10.0	11.4	7.0	-	-	-	-	-	7	20	32	10	*25	7	.0	83	1500
4	2	63	10.0	11.6	7.1	-	-	-	-	-	5	24	28	5	*25	4	.0	48	80
4	9	63	10.0	11.6	7.1	-	-	-	-	-	3	24	32	10	*25	4	.0	54	1400
4	16	63	11.0	11.0	7.3	-	-	-	-	-	3	24	24	10	*25	3	.0	44	1400
4	23	63	11.0	11.6	7.1	-	-	-	-	-	5	28	32	15	*25	4	.0	54	1200
4	30	63	22.0	10.2	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	5200
5	7	63	14.0	10.8	7.3	-	-	-	-	-	-	-	-	-	-	-	-	-	170
5	14	63	12.0	10.6	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	21	63	13.0	11.2	7.0	-	-	-	-	-	2	20	24	5	*25	4	.0	35	2000
5	28	63	15.0	10.6	7.1	-	-	-	-	-	3	20	24	5	*25	5	.0	49	160
6	4	63	13.0	10.2	7.1	-	-	-	-	-	3	20	28	10	*25	4	.0	35	3800
6	11	63	14.0	11.0	7.1	-	-	-	-	-	7	24	28	10	*25	5	.0	49	50
6	18	63	18.0	8.6	6.9	-	-	-	-	-	5	20	36	5	*25	4	.0	46	500
6	25	63	15.0	9.2	7.1	-	-	-	-	-	5	30	36	5	*25	16	.0	80	350

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE & LOWER SNAKE RIVER

STATION LOCATION CLEARWATER RIVER AT LEWISTON, IDAHO

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	2	63	16.0	8.6	7.1	–	–	–	–	–	4	26	32	5	*25	6	.0	46	260
7	9	63	21.0	8.0	7.1	–	–	–	–	–	4	30	36	10	*25	6	.0	50	140
7	16	63	20.0	7.2	7.1	–	–	–	–	–	–	–	–	–	–	–	–	–	200
7	23	63	21.0	7.0	7.1	–	–	–	–	–	–	–	–	–	–	–	–	–	220
7	30	63	22.0	6.8	7.1	–	–	–	–	–	4	32	28	5	*25	6	.0	40	210
8	6	63	24.0	6.0	7.0	–	–	–	–	–	3	30	30	5	*25	4	.0	38	300
8	13	63	26.0	5.4	6.9	–	–	–	–	–	6	36	28	0	*25	7	.0	67	610
8	20	63	24.0	5.0	7.1	–	–	–	–	–	8	32	28	5	*25	5	.0	62	340
8	27	63	20.0	7.4	7.1	–	–	–	–	–	4	34	28	0	*25	5	.0	56	500
9	3	63	22.0	7.6	6.9	–	–	–	–	–	3	36	32	0	*25	5	.0	60	1[illegible]
9	10	63	22.0	6.0	7.1	–	–	–	–	–	3	36	30	5	*25	5	.0	64	[illegible]
9	17	63	19.0	9.0	7.1	–	–	–	–	–	3	42	36	5	*25	6	.0	55	56[illegible]
9	24	63	1.9	6.8	7.1	–	–	–	–	–	3	36	28	5	*25	6	.0	75	60

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Spalding, Idaho
Data Supplied by U.S. Geological Survey

STATE: Idaho

MAJOR BASIN: Pacific Northwest

MINOR BASIN: Middle and Lower Snake River

STATION LOCATION: Clearwater River at Lewiston, Idaho

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	3.800	4.530	10.600	8.690	5.500	17.000	20.200	29.000	43.300	17.400	4.510	2.660
2	3.200	4.430	10.600	8.570	7.500	17.000	18.300	34.800	37.700	15.300	4.680	2.660
3	3.150	4.330	11.800	8.690	12.000	16.000	17.600	31.800	34.600	14.200	4.580	3.060
4	2.970	4.430	11.500	9.790	29.000	15.000	16.500	29.600	34.600	13.800	4.450	3.270
5	2.790	4.500	10.200	9.210	37.000	13.000	18.000	27.700	36.900	13.000	4.380	3.060
6	2.790	5.500	9.740	8.190	33.000	13.200	17.600	29.700	43.800	12.600	4.310	2.660
7	2.730	6.600	11.500	7.160	27.000	12.700	23.200	32.800	37.300	11.800	4.120	2.550
8	2.700	5.630	11.300	6.730	27.000	11.800	25.000	39.700	32.300	11.000	4.050	2.420
9	4.460	4.770	11.000	6.770	25.000	11.200	25.600	38.400	32.300	10.500	3.990	2.400
10	5.020	5.480	10.800	7.480	20.000	10.200	22.700	36.000	37.100	10.000	3.830	2.400
11	8.060	7.400	10.300	5.050	19.000	10.000	21.600	33.200	32.300	10.200	3.830	2.400
12	8.860	6.270	9.520	2.650	17.000	10.400	19.400	31.600	30.400	10.300	4.220	2.400
13	16.500	6.120	8.610	3.720	15.300	10.800	18.300	29.900	29.700	9.780	4.150	2.300
14	15.000	7.040	8.100	4.530	13.700	10.500	17.800	29.100	29.700	8.570	3.860	2.400
15	14.200	6.460	9.300	6.460	14.000	10.400	20.300	29.400	29.000	8.050	3.860	4.050
16	13.200	5.960	10.200	7.000	13.900	10.700	26.600	31.800	28.300	8.310	3.580	4.050
17	10.100	5.700	11.300	7.500	14.000	10.500	23.200	35.000	26.400	7.670	3.450	4.270
18	8.520	5.590	19.600	7.200	13.700	10.500	21.300	37.000	24.400	7.300	3.360	3.960
19	7.690	5.190	17.900	6.000	13.000	10.500	19.800	42.000	22.600	7.470	3.270	3.840
20	7.200	5.190	16.700	4.630	22.000	11.500	19.100	46.000	22.000	7.060	3.210	3.420
21	6.920	39.700	15.800	6.000	22.000	11.800	20.200	48.000	19.700	6.600	3.210	3.220
22	6.500	25.800	15.000	7.000	18.500	12.300	19.100	46.800	23.800	6.270	3.210	3.220
23	6.530	18.200	14.200	6.500	17.000	12.500	19.100	47.400	20.200	6.020	3.200	2.760
24	6.380	14.400	12.600	6.000	16.000	13.800	19.700	50.400	16.900	5.810	3.000	2.700
25	6.080	11.900	9.260	6.200	15.500	14.500	18.600	58.000	17.400	5.600	2.920	2.960
26	5.780	12.400	7.850	6.000	15.000	14.000	18.600	51.300	16.500	5.390	3.000	2.830
27	5.480	16.200	9.660	5.300	20.000	14.500	19.700	46.800	15.400	5.290	3.000	2.570
28	5.230	14.700	11.000	5.500	18.000	15.000	23.000	44.100	14.900	5.080	2.830	2.380
29	5.120	12.800	10.500	5.000		19.000	23.200	43.200	14.200	4.950	2.690	2.320
30	4.980	11.400	9.610	5.000		19.100	24.400	41.700	21.800	4.780	2.660	2.260
31	4.670		8.990	5.200		20.800		43.300		4.580	2.660	

COLUMBIA RIVER AT CLATSKANIE, OREGON

The Clatskanie station is the lower terminal Water Pollution Surveillance System station on the Columbia River, and monitors essentially the total outflow of the Columbia River drainage basin. Samples are collected at the wharf of Beaver Army Terminal, U. S. Army Transportation Supply and Maintenance Command.

The Cowlitz River and Willamette River are confluent to the Columbia in the reach upstream from Clatskanie and below the next mainstem monitoring station at Bonneville, Oregon. The nearest major upstream communities above this station are Portland, Oregon and Longview, Kelso, and Vancouver, Washington. These cities discharge a total BOD population equivalent of about 485,000 to either the mainstem or a tributary. Sewage treatment plant improvements now under construction will reduce this loading. Grains and timber are the principal crops grown in this reach, and pulp mills are the leading industrial activity, especially in the Kelso-Longview area.

Station Location: Columbia River At Clatskanie, Oregon

Major Basin: Pacific Northwest

Minor Basin: Columbia River below Yakima River

Station at: 46°10' Latitude 123°12' Longitude

Miles above mouth: 54

Activation Date: April 4, 1958

Sampled by: U.S. Army
U.S. Public Health Service

Field Analysis by: U.S. Public Health Service

Other Cooperating Agencies: Oregon State Sanitary Authority

Hydrologic Data:

Nearest pertinent gaging station: See Remarks

Gaging station operated by: [illegible] Geological Survey

Drainage area at gaging station: Estimated 259,000 square miles at sampling point.

Period of record: —

Average discharge in record period: Estimated 269,000 cfs. at sampling point

Maximum discharge in record period: —

Minimum discharge in record period: —

Remarks: Flow at Clatskanie computed as the sum of Columbia River near The Dalles plus 4 times the sum of Klickitat River near Pitt, Washington and Hood River and Conduit near Hood River, Oregon, plus Willamette River at Salem, Oregon plus 4.5 times the Cowlitz River at Castle Rock, Washington.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l
1- 8-63	0.06
3-18-63	0.04
3-25-63	0.05
4-15-63	0.02
7- 1-63	0.03
7- 8-63	0.10
8-12-63	0.06
8-26-63	0.07
9- 3-63	0.08
9- 9-63	0.07
9-16-63	0.07
9-23-63	0.05
9-30-63	0.05

ELEMENTAL ANALYSES

October to December		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.15	.15
	Na	8.0	5.8
	K	1.6	1.0
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	4	12
	Cd	*1	*1
	As	*8	*8
	B	12	13
	P	*2	*4
	Fe	80	4
	Mo	*1	2
	Mn	*.4	1
	Al	—	10
	Be	*.02	*.02
	Cu	13	11
	Ag	*2	.2
	Ni	8	2
	Co	*2	1
	Pb	*2	4
	Cr	2	5
	V	*1	16
	Ba	21	3
	Sr	76	35

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	.9	.2	April to June	1.3	.3
January to March	—	—	July to September	2.5	.5

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT CLATSKANIE, OREGON 7

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	1	62	10	25	-	-	-	-	-	-	8	6	22	6	30	8						
10	8	62	11	28	-	-	-	-	-	-	12	6	16	7	28	9						
10	16	62	12	3	-	-	-	-	-	-	12	3	41	4	53	5						
10	22	62	11	17	-	-	-	-	-	-	7	6	142	10	149	12						
10	29	62	11	26	-	-	-	-	-	-	17	3	60	4	77	5						
11	5	62	11	28	-	-	-	-	-	-	13	7	117	9	130	11						
11	13	62	1	8	-	-	-	-	-	-	320	10	39	7	359	12						
11	19	62	12	6	0	0	0	1	0	1	147	9	98	8	245	12						
11	21	62	12	31	-	-	-	-	-	-	33	5	66	4	99	6						
11	26	62	12	18	0	1	0	1	0	1	38	7	102	9	140	11						
12	5	62	1	2	0	0	0	1	0	1	13	4	48	5	61	6						
12	19	62	1	10	-	-	-	-	-	-	13	6	92	8	105	10						
12	26	62	1	15	0	0	1	1	1	1	7	6	96	8	103	10						
1	2	63	1	18	0	1	1	1	1	1	24	6	153	10	177	12						
1	8	63	1	24	-	-	-	-	-	-	34	7	159	9	193	11						
1	15	63	1	25	-	-	-	-	-	-	15	6	199	10	214	12						
1	21	63	2	6	-	-	-	-	-	-	43	7	369	13	412	15						
1	28	63	3	1	-	-	-	-	-	-	15	6	256	11	271	13						
2	4	63	2	20	-	-	-	-	-	-	51	7	89	9	140	11						
2	11	63	3	4	-	-	-	-	-	-	55	4	98	4	153	6						
2	18	63	3	11	-	-	-	-	-	-	69	53	82	7	151	53						
2	25	63	3	14	-	-	-	-	-	-	41	7	89	8	130	11						
3	4	63	3	22	0	1	0	1	0	1	29	6	103	8	132	10						
3	11	63	3	28	-	-	-	-	-	-	26	5	148	8	174	9						
3	18	63	4	4	-	-	-	-	-	-	39	7	42	10	81	12						
3	25	63	4	10	-	-	-	-	-	-	27	6	177	10	204	12						
4	1	63	4	16	0	1	0	1	0	1	63	8	94	8	157	11						
4	8	63	4	29	-	-	-	-	-	-	63	4	152	5	215	6						
4	15	63	4	29	1	1	0	0	1	1	116	4	106	4	222	6						
4	21	63	5	15	-	-	-	-	-	-	33	7	94	8	127	11						
4	29	63	5	15	-	-	-	-	-	-	45	7	134	9	179	11						
5	6	63	6	7	0	1	0	0	0	1	72	4	132	5	204	6						
5	13	63	6	7	-	-	-	-	-	-	38	3	82	4	120	5						
5	20	63	6	5	-	-	-	-	-	-	36	7	90	8	126	11						
5	27	63	6	12	-	-	-	-	-	-	42	7	86	9	128	11						
6	3	63	6	19	0	0	0	0	0	0	34	7	108	8	142	11						
6	10	63	6	25	-	-	-	-	-	-	23	6	73	8	96	10						
6	17	63	7	3	-	-	-	-	-	-	61	8	111	9	172	12						
6	24	63	7	10	-	-	-	-	-	-	36	7	94	9	130	11						
7	1	63	7	17	0	1	0	0	0	1	33	7	93	9	126	11						
7	8	63	7	31	-	-	-	-	-	-	18	6	110	8	128	10						

RADIOACTIVITY DETERMINATIONS

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT CLATSKANIE, OREGON

7

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON				
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
7	15	63	8	7	-	-	-	-	-	-	24	6	111	9	135	11						
7	22	63	8	12	-	-	-	-	-	-	35	4	104	4	139	6						
7	29	63	8	14	-	-	-	-	-	-	27	7	148	9	175	11						
8	5	63	8	19	0	0	0	1	0	1	25	3	205	5	230	6						
8	12	63	8	27	0	0	1	1	1	1	18	6	253	11	271	13						
8	19	63	9	6	-	-	-	-	-	-	20	6	175	10	195	12						
8	26	63	9	17	-	-	-	-	-	-	8	6	180	11	188	13						
9	3	63	9	23	0	1	1	1	1	1	23	3	203	6	226	7						
9	9	63	10	2	-	-	-	-	-	-	12	5	136	10	198	11						
9	16	63	10	10	-	-	-	-	-	-	4	5	223	12	227	13						
9	24	63	10	14	-	-	-	-	-	-	5	3	204	5	209	6						
9	30	63	10	17	-	-	-	-	-	-	18	6	204	11	222	13						

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT CLATSKANIE, OREGON

7

DATE OF SAMPLE					GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES									
BEGINNING			END								NEUTRALS							
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLORO-FORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	22	62	11	7	5160	112	40	72	0	9	12	1	1	9	1	5	4	0	10
11	7	62	11	30	3270	168	42	126	0	10	14	1	2	11	0	6	3	0	9
12	19	62	1	2	2690	216	31	185	-	-	-	-	-	-	-	-	-	-	-
2	11	63	2	20	5140	81	20	61	0	4	8	1	1	6	0	4	1	0	3
3	4	63	3	14	6630	76	38	38	-	-	-	-	-	-	-	-	-	-	-
4	4	63	4	12	5100	101	42	59	1	11	12	1	2	9	0	6	4	0	8
5	1	63	5	8	4550	96	37	59	-	-	-	-	-	-	-	-	-	-	-
6	5	63	6	14	4840	63	26	37	1	8	8	1	0	7	0	3	2	0	4
7	3	63	7	11	3840	111	48	63	0	15	12	0	1	10	1	6	5	1	9
8	7	63	8	18	4697	112	38	74	-	-	-	-	-	-	-	-	-	-	-
9	4	63	9	16	4390	117	44	73	1	12	13	2	1	9	1	5	5	1	7

PLANKTON POPULATION

STATE OREGON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER
STATION LOCATION COLUMBIA RIVER AT
CLATSKANIE, OREGON

7

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	2700	0	0	210	40	0	80	1160	1200	370	250	69	3	71	2	77	2	92	1											
10	16	62	2000	0	0	140	0	40	0	640	1160	500	330	77	2	71	2	69	1	84	1											
11	5	62	200	0	0	20	0	20	0	90	110	60	270																			
11	16	62	600	0	0	0	0	40	60	210	310	0	40																			
12	5	62	600	0	40	20	0	0	0	80	440	40	40																			
12	8	62	100	0	0	0	0	0	0	50	60	50	110																			
12	19	62	00	0	0	0	0	0	0	0	30	80	80																			
1	16	63	*	-	-	-	-	-	-	-	-	-	-																			
2	4	63	400	20	0	40	0	0	0	110	250	110	60																			
2	20	63	100	0	0	0	0	0	20	0	110	70	200																			
3	4	63	700	0	0	20	0	20	70	350	220	70	150	77	1	71	1															
3	11	63	300	0	0	0	0	0	20	90	220	70	240	77	1																	
3	18	63	200	20	0	70	0	20	0	20	70	0	200																			
3	20	63	800	0	0	0	0	90	0	180	510	110	180	77	2																	
4	3	63	400	0	0	20	0	0	0	90	240	20	290																			
4	15	63	600	20	40	40	0	0	40	290	200	0	220																			
5	7	63	1800	0	210	110	0	0	110	590	800	320	320	77	2	68	1	17	1	69	1											
5	16	63	1900	0	110	210	0	20	80	820	630	340	340	69	2	77	1	84	1													
6	5	63	2900	0	20	110	0	20	60	1110	1580	400	760	71	3	69	2	77	2	92	1	84	1									
6	19	63	3100	0	0	90	0	0	0	1230	1770	290	800	71	3	77	2	69	2	92	2	84	1	82	1							
7	3	63	3300	0	20	140	0	70	0	1580	1470	380	880	71	4	77	3	68	2	82	1											
7	17	63	4700	20	550	290	0	40	0	2050	1720	1450	1870	82	4	92	3	71	3	69	3	15	2	68	2	77	1	88	1			
7	31	63	2500	0	430	420	0	0	20	1080	600	1160	890	69	2	71	2	92	1	68	1											
8	21	63	1600	0	40	190	40	20	0	790	520	810	560	69	2	71	1	92	1													
9	19	63	2000	0	0	250	0	0	0	970	810	1780	970	69	3	84	2	92	1	71	1											

* PRESERVATIVE EXPIRED 12/21/63

PLANKTON POPULATION

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT CLATSKANIE, OREGON 007

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml.)	MICROINVERTEBRATES																			
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) (Number per ml.)	ROTIFERS										CRUSTACEA								HERBIVORES (Identifiable) (Number per liter)	OTHER ANIMAL FORMS (Number per liter)
														GENERA AND COUNT LEVEL (See text for Codes)										GENERA AND COUNT LEVEL (See text for Codes)									
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT			NUMBER PER LITER	1ST GENUS	1ST COUNT LEVEL	2ND GENUS	2ND COUNT LEVEL	3RD GENUS	3RD COUNT LEVEL	4TH GENUS	4TH COUNT LEVEL	5TH GENUS	5TH COUNT LEVEL	NUMBER PER LITER	1ST GENUS	1ST COUNT LEVEL	2ND GENUS	2ND COUNT LEVEL	3RD GENUS	3RD COUNT LEVEL		
10	1	62	58	32	[illegible]	22	47	18	9	6	22	-	-	507	11	5	17	5	22	3	16	2			0							0	0
10	16	62	82	18	47	14	9	12	58	10	46	-	-	153	11	5	17	4	20	1					3	76	1					0	0
11	5	62	82	24	92	13	9	11	58	9	43	-	-	2											0							0	0
11	16	62	82	18	56	12	58	9	92	9	52	-	-	6											0							0	0
12	5	62	82	17	92	9	26	6	56	6	62	-	-	0											0							0	0
12	8	62	82	11	71	8	2	8	56	7	66	110	-	0											0							0	0
12	19	62	92	15	82	14	58	8	9	6	57	-	-	0											0							0	0
1	16	63											-	-											-							-	-
2	4	63	9	16	82	9	47	8	2	6	61	60	-	0											0							0	0
2	20	63	92	24	62	11	55	9	47	7	49	-	-	0											0							0	0
3	4	63	9	48	82	13	61	5	92	5	29	-	-	1											0							0	0
3	11	63	9	32	92	10	56	6	62	5	47	-	-	0											0							0	0
3	18	63	91	55	25	9	82	8	89	4	24	-	-	51	17	3	11	2	46	1					9	76	2	50	1			0	0
3	20	63	9	39	82	28	56	10	92	4	19	-	-	0											0							0	0
4	3	63	9	26	82	10	92	9	56	4	51	-	-	1											0							0	0
4	15	63	82	45	9	15	2	6	92	6	28	-	-	2											0							0	0
5	7	63	9	41	61	25	92	4	27	3	27	-	-	-											-							-	-
5	16	63	61	46	9	24	56	9	47	9	12	-	-	-											-							-	-
6	5	63	9	25	61	17	47	9	92	8	41	-	-	-											-							-	-
6	19	63	61	20	9	17	47	10	82	9	44	-	-	-											-							-	-
7	3	63	61	33	47	16	35	13	83	7	31	-	-	-											-							-	-
7	17	63	56	29	36	24	82	9	92	6	32	-	-	-											-							-	-
7	31	63	56	59	47	8	92	6	82	5	22	-	-	-											-							-	-
8	21	63	47	20	58	20	56	18	92	8	34	-	-	-											-							-	-
9	19	63	58	40	47	22	56	16	82	4	18	-	-	-											-							-	-

736-491 O—64——4

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE: OREGON
MAJOR BASIN: PACIFIC NORTHWEST
MINOR BASIN: COLUMBIA RIVER BELOW YAKIMA RIVER
STATION LOCATION: COLUMBIA RIVER AT CLATSKANIE, OREGON

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	3	62	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	360
11	7	62	12.3	9.5	7.8	1.1	–	–	–	–	–	–	–	–	–	–	–	–	6300
11	19	62	–	–	7.9	–	–	–	–	–	–	–	–	–	–	–	–	–	–
11	21	62	–	–	7.6	–	10	1.5	4.0	–	5	48	52	5	*25	12	.0	98	..
11	26	62	–	–	7.9	–	–	–	–	–	3	48	48	0	*25	13	.0	77	700
12	5	62	7.7	12.0	7.5	1.2	10	1.9	4.9	.1	6	44	48	5	*25	15	.0	63	–
12	19	62	8.7	11.9	7.8	1.4	16	2.1	4.7	.1	6	36	48	5	*25	11	.0	85	2700
12	26	62	–	–	7.8	–	–	–	–	–	5	48	52	5	*25	12	.0	98	600
1	2	63	6.7	10.4	7.6	1.9	8	1.9	4.2	.1	3	58	88	–	*25	15	.0	120	–
1	8	63	–	–	7.5	–	–	–	–	–	7	62	80	–	*25	16	.0	105	–
1	16	63	3.6	13.1	7.6	.4	9	1.6	3.5	.3	5	48	60	–	*25	16	.0	95	–
1	21	63	–	–	7.9	–	–	–	–	–	5	58	64	–	*25	15	.1	106	490
2	6	63	6.2	12.5	8.1	1.6	14	–	–	–	6	60	72	–	*25	18	.0	105	–
2	11	63	–	–	7.4	–	–	–	–	–	–	–	–	–	–	–	–	–	2000
2	20	63	5.8	12.8	–	1.4	19	2.7	7.2	1.4	5	52	24	5	85	18	.0	95	–
2	25	63	–	–	8.1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
3	6	63	7.0	12.6	7.9	2.0	8	1.5	3.4	1.6	4	48	52	5	*25	13	.0	90	–
3	11	63	–	–	7.3	–	–	–	–	–	4	56	76	5	*25	12	.0	103	870
3	20	63	7.5	11.7	7.3	.9	12	2.2	4.1	.5	6	56	64	5	*25	13	.0	106	–
3	25	63	–	–	6.9	–	–	–	–	–	5	60	64	5	*25	14	.0	100	70
4	1	63	8.2	12.6	7.2	1.5	18	1.6	5.8	.1	7	60	68	5	*25	15	.0	108	–
4	3	63	–	–	–	–	–	–	–	–	7	40	44	10	*25	11	.0	91	–
4	8	63	–	–	8.1	–	–	–	–	–	–	–	–	–	–	–	–	–	2800
4	15	63	10.0	11.1	7.6	1.1	8	1.4	3.4	.3	4	40	40	5	*25	8	.0	62	–
4	21	63	–	–	7.2	–	–	–	–	–	6	48	56	5	*25	19	.0	101	–
4	29	63	–	–	–	–	–	–	–	–	7	44	56	5	*25	9	.0	75	–
5	1	63	10.8	11.3	7.6	1.6	8	1.8	4.0	.1	4	48	64	5	*25	11	.0	79	–
5	6	63	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	190
5	16	63	12.5	11.4	7.6	.9	9	1.5	–	.1	8	56	60	5	*25	12	.0	124	–
5	20	63	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
5	27	63	–	–	–	–	–	–	–	–	3	52	52	0	*25	12	.0	70	–
6	5	63	14.9	10.6	7.9	1.0	10	1.4	4.2	.2	4	56	64	5	*25	14	.0	110	–
6	10	63	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1700
6	19	63	17.7	10.5	7.8	2.5	10	1.6	3.8	.1	5	50	64	10	*25	20	.0	82	–
6	24	63	–	–	–	–	–	–	–	–	7	50	68	10	*25	13	.0	90	200
7	3	63	16.5	10.7	7.9	1.9	12	–	–	.1	5	56	60	5	*25	13	.0	87	–
7	8	63	–	–	–	–	–	–	–	–	5	50	72	5	*25	14	.0	102	120
											7	56	72	0	*25	11	.0	95	–

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT CLATSKANIE, OREGON 7

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	17	63	17.5	9.9	8.0	2.0	5	1.5	3.5	.0	5	54	64	5	*25	14	.0	86	12000
7	22	63	–	–	–	–	–	–	–	–	5	56	68	0	*25	14	.0	85	–
7	29	63	19.2	9.1	–	–	–	–	–	–	4	50	62	5	*25	15	.0	88	–
8	5	63	19.8	8.6	–	1.2	–	–	–	–	5	56	64	5	*25	14	.0	80	–
8	7	63	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	800
8	12	63	–	–	–	–	–	–	–	–	6	56	62	0	*25	14	.0	84	–
8	19	63	21.0	6.7	7.7	.0	9	1.3	3.2	–	7	60	66	5	*25	14	.0	86	–
8	21	63	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	500
8	26	63	–	–	–	–	–	–	–	–	7	60	74	5	*25	15	.0	103	–
9	3	63	20.0	8.1	–	–	–	–	–	–	7	60	72	0	*25	15	.0	99	–
9	4	63	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	600
9	9	63	–	–	–	–	–	–	–	–	5	62	72	5	*25	16	.0	107	–
9	16	63	20.2	7.9	7.8	1.1	9	1.5	4.3	.1	4	62	72	0	*25	18	.0	107	–
9	19	63	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	400
9	23	63	–	–	–	–	–	–	–	–	6	68	66	5	*25	17	.0	113	–

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Computed Data for Clatskanie, Oregon
Data Supplied by U.S. Geological Survey

STATE Oregon

MAJOR BASIN Pacific Northwest

MINOR BASIN Columbia River below Yakima River

STATION LOCATION Columbia River at Clatskanie, Oregon

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	117.000	136.000	329.000	199.000	158.000	211.000	308.000	267.000	416.000	360.000	203.000	120.000
2	124.000	135.000	332.000	208.000	239.000	209.000	273.000	295.000	430.000	360.000	186.000	114.000
3	121.000	131.000	333.000	231.000	442.000	241.000	245.000	311.000	427.000	364.000	168.000	114.000
4	117.000	134.000	324.000	227.000	459.000	250.000	248.000	316.000	409.000	345.000	171.000	120.000
5	115.000	124.000	309.000	222.000	511.000	223.000	255.000	309.000	399.000	340.000	176.000	127.000
6	117.000	141.000	329.000	213.000	457.000	233.000	301.000	351.000	428.000	325.000	180.000	130.000
7	118.000	141.000	303.000	199.000	416.000	206.000	323.000	380.000	430.000	322.000	165.000	116.000
8	127.000	138.000	296.000	190.000	404.000	200.000	314.000	410.000	414.000	318.000	177.000	106.000
9	150.000	139.000	295.000	190.000	367.000	183.000	308.000	419.000	402.000	306.000	158.000	114.000
10	189.000	148.000	268.000	186.000	326.000	181.000	287.000	407.000	413.000	318.000	156.000	109.000
11	175.000	159.000	250.000	178.000	302.000	184.000	290.000	381.000	420.000	303.000	154.000	115.000
12	178.000	162.000	249.000	177.000	275.000	188.000	275.000	355.000	422.000	313.000	150.000	121.000
13	177.000	162.000	242.000	182.000	284.000	185.000	268.000	328.000	432.000	302.000	153.000	115.000
14	195.000	158.000	259.000	177.000	267.000	185.000	264.000	300.000	449.000	299.000	159.000	119.000
15	198.000	168.000	238.000	184.000	222.000	175.000	275.000	289.000	457.000	302.000	168.000	125.000
16	205.000	161.000	279.000	179.000	232.000	165.000	303.000	286.000	466.000	280.000	179.000	126.000
17	196.000	155.000	274.000	178.000	226.000	159.000	309.000	287.000	471.000	279.000	171.000	132.000
18	186.000	158.000	268.000	184.000	229.000	160.000	302.000	290.000	477.000	285.000	165.000	135.000
19	162.000	154.000	263.000	175.000	277.000	152.000	298.000	298.000	469.000	292.000	160.000	141.000
20	156.000	331.000	254.000	170.000	308.000	149.000	297.000	308.000	453.000	290.000	159.000	151.000
21	156.000	477.000	238.000	163.000	312.000	152.000	291.000	307.000	448.000	270.000	162.000	127.000
22	151.000	426.000	222.000	168.000	271.000	158.000	286.000	314.000	449.000	258.000	164.000	119.000
23	154.000	334.000	216.000	171.000	262.000	164.000	280.000	346.000	447.000	242.000	163.000	120.000
24	152.000	296.000	217.000	168.000	241.000	177.000	274.000	334.000	441.000	228.000	153.000	120.000
25	159.000	312.000	199.000	150.000	234.000	180.000	273.000	390.000	432.000	233.000	158.000	131.000
26	163.000	411.000	196.000	146.000	262.000	170.000	262.000	438.000	427.000	228.000	155.000	126.000
27	151.000	421.000	177.000	157.000	219.000	185.000	255.000	415.000	422.000	206.000	141.000	120.000
28	146.000	381.000	174.000	147.000	210.000	190.000	263.000	396.000	410.000	210.000	135.000	120.000
29	151.000	350.000	178.000	144.000		239.000	263.000	404.000	384.000	184.000	143.000	118.000
30	150.000	334.000	196.000	151.000		298.000	265.000	418.000	366.000	173.000	143.000	116.000
31	141.000		211.000	137.000		319.000		421.000		180.000	128.000	

Computed as sum of Columbia River near The Dalles, Oregon plus 4 times the sum of Klickitat River near Pitt, Washington and Hood River and Conduit near Hood River, Oregon, plus Willamette River at Salem, Oregon plus 4.5 times the Cowlitz River at Castle Rock, Washington.

COLUMBIA RIVER AT BONNEVILLE, OREGON

The Bonneville Water Pollution Surveillance System station is located in the Bonneville Dam Powerhouse. The Columbia River is navigable at this point and above. Occasional pollution has resulted from oil leaks in barges carrying petroleum products. Hood River and The Dalles, Oregon and White Salmon, Washington are the three major upstream communities. All are within 40 miles of the sampling point and discharge treated wastes to the mainstem. There are lumber mills at Cascade Locks and Stevenson, Washington, 4 miles upstream.

The Columbia River in this area is extensively used for power production and recreation.

Station Location: Columbia River At Bonneville, Oregon

Major Basin: Pacific Northwest

Minor Basin: Columbia River below Yakima River

Station at: 45°38' Latitude 121°57' Longitude

Miles above mouth: 146

Activation Date: November 11, 1957

Sampled by: U.S. Army Corps of Engineers

Field Analysis by: Crown Zellerbach Corporation

Other Cooperating Agencies: Oregon State Sanitary Authority

Hydrologic Data:

Nearest pertinent gaging station: See Remarks

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: Estimated 240,000 square miles at sampling point

Period of record: —

Average discharge in record period: Estimated 200,000 cfs. at sampling point

Maximum discharge in record period: —

Minimum discharge in record period: —

Remarks: Flow at Bonneville computed as the sum of Columbia River near The Dalles, Oregon plus twice the sum of Klickitat River near Pitt, Washington and Hood River and Conduit near Hood River, Oregon.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.10	.35
	Na	11	7.6
	K	2.1	1.3
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	7	25
	Cd	*1	*1
	As	*14	*9
	B	34	21
	P	*4	*5
	Fe	65	10
	Mo	*1	*2
	Mn	*.7	*1
	Al	—	16
	Be	*.04	*.02
	Cu	8	9
	Ag	*.3	*.2
	Ni	*1	*1
	Co	*3	*1
	Pb	42	14
	Cr	1	5
	V	*1	*5
	Ba	32	26
	Sr	105	45

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.2	.3	April to June	—	—
January to March	—	—	July to September	1.2	.2

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT BONNEVILLE, OREGON 8

DATE SAMPLE TAKEN			DATE OF DETERMINATION		RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON					
					ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	1	62	12	13	-	-	-	-	-	-	2	6	73	9	75	11						
10	15	62	11	9	-	-	-	-	-	-	20	5	87	8	107	9						
11	13	62	12	27	-	-	-	-	-	-	4	5	89	8	93	9						
11	26	62	12	15	0	0	1	1	1	1	22	5	122	7	144	9						
12	3	62	1	3	0	0	1	1	1	1	380	13	203	11	583	17						
12	17	62	1	9	-	-	-	-	-	-	7	6	164	10	171	12						
1	7	63	1	21	0	0	0	1	0	1	31	3	241	5	272	6						
1	21	63	2	6	-	-	-	-	-	-	10	6	201	10	211	12						
2	4	63	2	19	0	0	0	1	0	1	30	7	263	12	293	14						
2	18	63	3	7	-	-	-	-	-	-	117	18	129	9	246	20						
3	4	63	3	22	0	0	0	1	0	1	40	7	175	10	215	12						
4	1	63	4	16	-	-	-	-	-	-	48	7	315	12	363	14						
4	15	63	5	1	0	0	0	1	0	1	50	7	311	12	361	14						
5	13	63	6	3	0	1	1	1	1	1	81	4	134	4	215	6						
5	27	63	6	12	-	-	-	-	-	-	70	15	119	9	189	17						
6	10	63	6	25	-	-	-	-	-	-	33	7	2	6	35	9						
6	24	63	7	10	-	-	-	-	-	-	44	7	104	9	148	11						
7	8	63	7	24	0	0	1	1	1	1	29	6	128	9	157	11						
7	22	63	8	12	-	-	-	-	-	-	31	3	129	4	160	5						
8	5	63	8	19	0	0	1	1	1	1	31	3	313	6	344	7						
8	19	63	9	16	0	1	0	0	0	1	28	3	210	6	238	7						
9	3	63	9	17	0	0	1	1	1	1	15	6	329	12	344	13						
9	16	63	10	2	-	-	-	-	-	-	18	6	257	12	275	13						

PLANKTON POPULATION

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT BONNEVILLE, OREGON 8

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
				BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR	TOTAL	COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	500	0	10	20	0	0	30	310	150	400	400	69	1																		
10	15	62	400	0	0	40	0	40	0	120	210	0	0																				
11	13	62	400	0	0	0	0	0	40	290	80	40	40																				
11	26	62	1000	0	0	0	0	0	0	250	730	0	40	84	2																		
12	3	62	200	0	0	30	0	0	0	30	110	30	170																				
12	17	62	200	0	0	0	0	0	0	20	130	50	130																				
1	7	63	200	0	0	0	0	0	0	40	140	10	10																				
1	21	63	500	0	40	0	0	0	0	190	230	80	130																				
2	4	63	00	0	0	0	0	0	0	20	20	20	80																				
2	18	63	100	0	0	0	0	0	0	60	60	210	360																				
3	4	63	1100	0	110	0	0	0	170	480	320	380	500	71	2																		
3	18	63	1100	0	60	0	0	40	20	480	460	110	360	77	2	71	1																
4	1	63	500	0	20	20	0	20	0	110	290	20	200	77	1																		
4	15	63	400	0	0	40	0	20	0	70	240	70	310																				
5	13	63	900	0	0	0	0	20	20	530	330	150	350	69	2	77	1																
5	27	63	3300	0	20	110	0	40	0	1220	1910	780	780	77	3	71	3	69	2	84	1	87	1	88	1								
6	10	63	1000	0	0	0	0	20	0	400	550	330	370	69	1	77	1																
6	24	63	1900	0	40	260	0	40	0	420	1140	260	260	77	2	92	2	38	1	69	1	71	1										
7	8	63	2800	0	0	40	80	20	0	620	2070	150	330	93	4	71	1	69	1	77	1	92	1	82	1								
7	22	63	9800	20	1830	370	0	70	70	3080	4360	1170	2000	71	5	82	4	15	4	92	2	69	2	88	2	87	1	77	1	79	1		
8	5	63	3600	0	350	980	30	0	50	1300	890	3350	2120	69	3	71	2	25	2	84	2	22	2	92	1								
8	19	63	1400	0	190	60	100	20	0	830	170	500	190	69	3	22	1																
9	3	63	1000	20	0	200	0	40	0	280	390	1010	950	92	1	69	1																
9	16	63	1600	0	0	160	0	0	0	720	740	1780	830	69	2	92	2	71	1														

PLANKTON POPULATION

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT BONNEVILLE, OREGON 008

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) Number per ml.	ROTIFERS										CRUSTACEA								NEMATODES (Identifiable) Number per liter	OTHER ANIMAL FORMS (Number per liter)
															GENERA AND COUNT LEVEL (See text for Codes)											GENERA AND COUNT LEVEL (See text for Codes)									
															1ST		2ND		3RD		4TH		5TH			1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT			NUMBER PER LITER	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	NUMBER PER LITER	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	1	62	58	27	82	24	9	15	92	9	25	–	–	363	11	5	22	5	17	5	21	3	18	1	0						1	0
10	15	62	82	15	47	14	58	13	92	12	46	–	–	5											0						0	0
11	13	62	95	40	47	16	46	7	77	7	30	–	–	11	11	1									0						0	0
11	26	62	80	13	82	11	9	10	47	9	57	–	–	0											0						0	0
12	3	62	56	17	47	9	92	8	2	7	59	80	–	0											0						0	0
12	17	62	92	13	82	12	80	8	56	7	60	–	–	0											0						0	0
1	7	63	56	61	47	8	9	6	92	4	21	–	–	0											0						0	0
1	21	63	82	32	9	18	92	8	71	6	36	20	–	0											0						0	0
2	4	63	9	16	62	10	80	8	47	8	58	–	–	0											0						0	0
2	18	63	62	16	92	10	36	9	55	9	56	–	–	–											–						–	–
3	4	63	9	38	82	9	92	7	70	4	42	–	–	0											1						0	0
3	18	63	9	60	61	13	92	7	95	2	18	–	–	1											0						0	0
4	1	63	9	23	92	11	47	10	61	8	48	–	–	0											0						0	0
4	15	63	82	36	92	7	9	7	62	6	44	–	–	2											0						0	0
5	13	63	95	59	9	16	47	4	71	3	18	–	–	–											–						–	–
5	27	63	47	19	9	17	61	11	82	8	45	–	–	–											–						–	–
6	10	63	61	21	47	18	9	12	95	10	39	–	–	–											–						–	–
6	24	63	9	27	61	20	47	10	92	8	35	–	–	–											–						–	–
7	8	63	35	42	47	10	61	9	82	9	30	–	–	–											–						–	–
7	22	63	82	22	35	20	47	10	56	10	38	–	–	–											–						–	–
8	5	63	47	18	56	17	92	15	35	9	41	–	–	–											–						–	–
8	19	63	56	33	58	31	92	9	47	9	18	–	–	–											–						–	–
9	3	63	58	33	89	18	47	13	9	12	24	–	–	–											–						–	–
9	16	63	58	41	47	29	92	9	56	6	15	–	–	–											–						–	–

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT BONNEVILLE, OREGON

8

DATE OF SAMPLE					GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES									
BEGINNING			END								NEUTRALS							
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLOROFORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	OXYGENATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	1	62	10	12	3770	108	34	74	–	–	–	–	–	–	–	–	–	–	–
11	13	62	11	25	5073	113	46	67	–	–	–	–	–	–	–	–	–	–	–
12	3	62	12	17	4638	109	23	86	–	–	–	–	–	–	–	–	–	–	–
12	3	62		*	13481	111	35	76	1	8	12	1	1	10	0	4	2	1	7
1	7	63	1	21	4420	95	22	73	–	–	–	–	–	–	–	–	–	–	–
2	4	63	2	18	3958	120	38	82	1	11	12	1	1	9	1	5	3	1	5
3	4	63	3	18	3994	113	42	71	–	–	–	–	–	–	–	–	–	–	–
4	1	63	4	15	4005	90	34	56	1	9	12	2	2	8	0	4	3	0	5
5	13	63	5	27	3276	267	43	224	–	–	–	–	–	–	–	–	–	–	–
6	10	63	6	24	2775	110	35	75	1	8	14	3	2	9	0	5	2	1	4
7	8	63	7	22	3790	83	30	53	–	–	–	–	–	–	–	–	–	–	–
8	5	63	8	19	3831	55	16	39	0	6	3	0	1	2	0	2	1	0	4
9	3	63	9	16	3621	64	19	45	–	–	–	–	–	–	–	–	–	–	–

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT BONNEVILLE, OREGON 8

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	1	62	17.7	8.8	8.3	1.2	9	1.0	1.8	.2	4	66	71	0	5	15	.0	108	38
10	15	62	-	8.9	8.2	.7	10	.9	1.6	.2	5	72	72	10	5	17	.0	130	180
11	13	62	12.0	9.9	7.6	.6	8	.9	1.6	.1	7	72	76	0	*25	23	.0	135	580
11	26	62	9.5	10.8	8.1	.9	10	.7	1.8	.1	5	74	92	0	*25	20	.0	85	34
12	3	62	-	-	7.7	-	-	-	-	-	4	70	80	5	*25	19	.0	120	-
12	10	62	7.5	11.5	8.1	1.4	11	.9	1.7	.2	-	-	-	-	-	-	-	-	290
12	17	62	-	-	7.9	-	-	-	-	-	6	66	80	5	*25	20	.0	124	-
1	7	63	6.0	11.7	7.9	1.1	10	1.1	1.6	.2	5	68	64	-	*25	18	.0	110	560
1	21	63	3.1	12.7	8.0	.8	10	.5	1.4	.2	4	72	76	-	*25	18	.0	100	220
2	4	63	2.7	12.5	8.1	1.7	12	.5	1.4	.2	4	86	88	-	*25	20	.0	115	160
2	18	63	4.7	13.2	7.9	2.0	23	1.6	3.2	.3	4	64	80	5	160	29	.0	120	200
3	4	63	6.0	12.1	8.0	.6	14	.9	2.0	.2	-	-	-	-	-	-	-	-	110
4	1	63	7.8	11.2	7.1	.5	9	.8	2.6	.2	5	64	72	5	*25	16	.0	115	120
4	15	63	9.6	11.5	7.1	4.9	10	.9	2.9	.2	6	60	32	5	*25	16	.0	113	65
4	29	63	10.6	11.4	8.1	5.5	13	1.1	3.0	.1	-	64	-	10	30	-	.0	-	380
5	13	63	11.8	11.4	8.1	7.0	13	1.1	2.5	.1	5	64	68	0	*25	15	.1	112	-
5	27	63	15.3	10.4	8.1	1.7	13	1.3	3.0	.1	5	54	64	10	*25	13	.0	107	80
6	10	63	14.6	10.5	8.1	1.4	7	1.3	3.2	.1	5	52	60	5	*25	13	.0	79	100
6	18	63	6.8	11.9	8.0	1.2	10	.8	2.0	.2	4	72	76	5	*25	14	.0	110	22
6	24	63	16.3	10.0	8.2	.7	12	.9	2.7	.2	4	54	68	10	*25	13	.0	93	100
7	8	63	17.5	9.7	8.2	1.9	10	.7	2.1	.2	4	52	76	0	*25	11	.0	89	64
7	22	63	18.9	9.2	8.3	.4	11	1.1	2.3	.1	5	54	68	0	*25	12	.0	85	46
8	5	63	19.1	-	8.3	.7	15	1.1	2.3	.2	5	58	66	0	*25	14	.0	80	-
8	19	63	20.7	8.0	7.8	.6	7	1.1	2.3	.1	8	60	68	0	*25	16	.0	88	5
9	3	63	20.0	8.2	8.4	.8	11	1.1	2.0	.1	4	62	68	0	*25	16	.0	102	-
9	4	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
9	16	63	21.0	7.8	8.4	1.0	11	.8	1.9	.1	5	66	70	0	*25	19	.0	113	930
9	30	63	19.0	8.5	8.3	1.4	9	1.1	2.2	.0	-	-	-	-	-	-	-	-	20

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Computed Data for Bonneville, Oregon
Supplied by U.S. Geological Survey

STATE Oregon

MAJOR BASIN Pacific Northwest

MINOR BASIN Columbia River below Yakima River

STATION LOCATION Columbia River at Bonneville, Oregon

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	93.200	108.000	150.000	125.000	111.000	157.000	142.000	200.000	369.000	327.000	179.000	100.000
2	101.000	108.000	158.000	126.000	108.000	157.000	139.000	220.000	381.000	328.000	164.000	96.500
3	97.800	103.000	154.000	141.000	144.000	159.000	142.000	230.000	375.000	333.000	149.000	96.100
4	91.800	107.000	156.000	136.000	172.000	153.000	151.000	233.000	360.000	317.000	149.000	102.000
5	89.300	101.000	151.000	136.000	226.000	154.000	154.000	232.000	350.000	313.000	155.000	109.000
6	91.600	113.000	169.000	139.000	214.000	163.000	153.000	232.000	378.000	299.000	159.000	114.000
7	92.900	110.000	140.000	130.000	205.000	144.000	152.000	232.000	387.000	295.000	144.000	99.900
8	93.100	107.000	139.000	130.000	208.000	142.000	155.000	243.000	370.000	288.000	156.000	90.200
9	99.800	105.000	145.000	130.000	205.000	134.000	176.000	257.000	361.000	276.000	137.000	97.200
10	111.000	105.000	137.000	130.000	195.000	133.000	164.000	263.000	374.000	289.000	136.000	91.200
11	104.000	105.000	135.000	130.000	187.000	138.000	176.000	260.000	380.000	268.000	134.000	94.100
12	103.000	105.000	135.000	131.000	170.000	140.000	176.000	248.000	382.000	284.000	129.000	103.000
13	104.000	103.000	136.000	140.000	173.000	139.000	171.000	231.000	391.000	267.000	132.000	97.300
14	126.000	100.000	147.000	134.000	167.000	140.000	163.000	214.000	409.000	267.000	137.000	98.400
15	134.000	113.000	127.000	133.000	162.000	131.000	156.000	213.000	416.000	271.000	148.000	104.000
16	149.000	107.000	129.000	136.000	166.000	122.000	160.000	211.000	426.000	246.000	161.000	102.000
17	143.000	104.000	133.000	137.000	160.000	115.000	174.000	216.000	431.000	245.000	152.000	106.000
18	137.000	106.000	140.000	142.000	160.000	117.000	187.000	220.000	432.000	259.000	147.000	110.000
19	117.000	102.000	163.000	139.000	158.000	117.000	178.000	227.000	428.000	265.000	142.000	119.000
20	114.000	127.000	162.000	135.000	161.000	115.000	188.000	233.000	414.000	265.000	138.000	130.000
21	115.000	132.000	158.000	128.000	168.000	118.000	189.000	236.000	411.000	245.000	141.000	108.000
22	112.000	147.000	146.000	133.000	175.000	123.000	192.000	215.000	412.000	233.000	143.000	99.000
23	116.000	153.000	147.000	137.000	177.000	126.000	197.000	249.000	410.000	209.000	144.000	98.400
24	116.000	150.000	153.000	135.000	169.000	122.000	194.000	242.000	406.000	204.000	134.000	98.200
25	125.000	142.000	142.000	118.000	167.000	128.000	195.000	303.000	395.000	204.000	135.000	108.000
26	129.000	147.000	141.000	115.000	163.000	124.000	191.000	375.000	395.000	197.000	135.000	106.000
27	118.000	150.000	128.000	126.000	159.000	132.000	187.000	355.000	389.000	182.000	120.000	100.000
28	112.000	146.000	126.000	117.000	156.000	120.000	197.000	341.000	378.000	186.000	117.000	100.000
29	117.000	158.000	129.000	115.000		122.000	197.000	351.000	353.000	161.000	125.000	98.400
30	117.000	167.000	134.000	124.000		128.000	201.000	365.000	333.000	151.000	125.000	96.400
31	112.000		138.000	109.000		136.000		371.000		158.000	110.000	

Computed as sum of Columbia River near The Dalles, Oregon plus twice the sum of Klickitat River near Pitt, Washington and Hood River and conduit near Hood River, Oregon.

COLUMBIA RIVER AT McNARY DAM, OREGON

The McNary Dam Surveillance System station is located in the McNary Dam powerhouse and monitors the outflow from McNary Reservoir.

There are no major communities on the Columbia River between McNary Dam and the next upstream surveillance station at Pasco, Washington. There is, however, a pulp mill in this reach. The principal economic activity in the area is wheat farming. A moderate amount of irrigation is practiced.

The Snake River is confluent to the Columbia in the McNary Dam-Pasco reach.

Station Location: Columbia River at McNary Dam, Oregon

Major Basin: Pacific Northwest

Minor Basin: Columbia River below Yakima River

Station at: 45°57' Latitude 119°18' Longitude

Miles above mouth: 292

Activation Date: April 1, 196[illegible]

Sampled by: U. S. Army Corps of Engineers
Washington State Pollution Control Commission

Field Analysis by: Public Health Service

Other Cooperating Agencies: Washington State Department of Health
U. S. Geological Survey

Hydrologic Data:

Nearest pertinent gaging station: below McNary Dam, Oregon

Gaging station operated by: U. S. Geological Survey

Drainage area at gaging station: 214,000 square miles

Period of record: 1950 to present

Average discharge in record period: 188,500 cfs.

Maximum discharge in record period: 818,000 cfs.

Minimum discharge in record period: 50,600 cfs.

Remarks: Irrigation diversions above station. Flow regulated somewhat by Roosevelt Lake and tributary reservoirs. Flow affected by McNary Dam power plant operation since April 1953.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.20	.20
	Na	10	6.9
	K	2.3	1.3
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	37	11
	Cd	*1	*1
	As	*12	*12
	B	22	14
	P	104	*6
	Fe	146	5
	Mo	*2	*3
	Mn	2	*1
	Al	—	14
	Be	*.03	*.03
	Cu	26	21
	Ag	*.2	*.3
	Ni	*1	*1
	Co	*2	*1
	Pb	*3	4
	Cr	3	7
	V	*1	*6
	Ba	23	30
	Sr	122	53

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.0	.2	April to June	1.1	.2
January to March	1.4	.3	July to September	2.6	.4

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l
11/5-11/19/62	DDT	

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT MCNARY DAM, OREGON 81

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER														RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO	DAY	YR	MO	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO	DAY	pc/g	±	pc/g	±
10	1	62	11	15	0	0	2	1	2	1	13	6	119	9	132	11						
10	8	62	11	2	-	-	-	-	-	-	38	6	235	12	273	13						
10	22	62	11	13	-	-	-	-	-	-	9	2	83	4	92	4						
10	29	62	11	21	-	-	-	-	-	-	31	7	202	10	233	12						
11	5	62	11	26	-	-	-	-	-	-	18	6	177	8	195	10						
11	12	62	1	2	0	0	1	1	1	1	13	4	133	6	146	7						
11	19	62	12	13	-	-	-	-	-	-	12	6	273	12	285	13						
11	26	62	12	19	-	-	-	-	-	-	21	6	239	11	260	12						
12	3	62	12	28	-	-	-	-	-	-	56	6	209	10	265	12						
12	10	62	1	4	0	0	1	1	1	1	30	6	189	10	219	12						
12	17	62	1	9	1	1	0	0	1	1	17	6	201	10	218	12						
12	24	62	1	14	0	0	1	1	1	1	17	3	239	6	256	6						
12	31	62	1	15	-	-	-	-	-	-	36	6	405	13	441	14						
1	7	63	1	21	-	-	-	-	-	-	38	3	375	6	413	8						
1	14	63	1	25	0	0	1	1	1	1	32	6	261	11	293	13						
1	21	63	2	6	-	-	-	-	-	-	19	6	265	11	284	13						
1	28	63	2	19	-	-	-	-	-	-	26	7	275	12	301	14						
2	4	63	2	21	1	1	0	0	1	1	15	7	301	13	316	15						
2	11	63	3	1	0	3	0	1	0	3	105	41	180	11	285	43						
2	18	63	3	11	0	0	1	1	1	1	35	3	187	5	222	6						
2	25	63	3	14	1	1	1	1	2	1	22	6	173	11	195	13						
3	4	63	3	22	0	0	1	1	1	1	35	6	250	11	285	13						
3	11	63	4	12	1	1	3	1	4	1	26	3	278	6	304	7						
3	18	63	4	8	0	0	1	1	1	1	42	4	270	6	312	7						
3	25	63	4	8	1	1	1	1	2	1	76	4	489	7	565	8						
4	1	63	4	16	0	1	1	1	1	1	61	7	370	13	431	15						
4	8	63	4	25	0	0	1	1	1	1	32	6	246	11	278	13						
4	15	63	4	29	0	1	1	1	1	1	90	4	354	6	444	7						
4	22	63	5	6	0	1	1	1	1	1	108	4	411	7	519	8						
4	29	63	5	15	0	0	1	1	1	1	42	7	213	11	255	13						
5	6	63	6	7	0	1	1	1	1	1	63	4	175	6	238	7						
5	14	63	6	5	0	0	0	1	0	1	44	7	129	9	173	11						
5	20	63	6	12	0	1	1	1	1	1	19	6	113	9	132	10						
5	27	63	6	12	0	1	0	0	0	1	33	7	111	9	144	11						
6	10	63	6	25	0	1	0	1	0	1	33	6	76	8	109	10						
6	17	63	7	3	-	-	-	-	-	-	18	5	117	9	135	10						
6	24	63	7	10	0	0	0	1	0	1	35	7	130	10	165	12						
7	1	63	7	17	0	1	0	1	0	1	28	6	163	10	191	12						
7	9	63	7	31	0	0	0	1	0	1	37	6	167	10	204	12						
7	15	63	8	7	0	0	1	1	1	1	47	7	173	10	220	12						

RADIOACTIVITY DETERMINATIONS

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT MCNARY DAM, OREGON

DATE SAMPLE TAKEN			DATE OF DETERMINATION		RADIOACTIVITY IN WATER												DATE OF DETERMINATION		RADIOACTIVITY IN PLANKTON			
					ALPHA						BETA								GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
7	22	63	8	12	0	1	1	1	1	1	57	4	176	5	233	6						
7	29	63	8	14	0	0	0	0	0	0	41	7	337	12	378	14						
8	5	63	8	21	0	0	0	0	0	0	47	6	406	13	453	14						
8	12	63	8	27	0	0	0	1	0	1	39	6	345	13	384	14						
8	19	63	9	16	0	1	0	1	0	1	32	3	238	6	270	7						
8	26	63	9	17	0	1	0	1	0	1	25	6	270	12	295	13						
9	2	63	9	20	0	0	1	1	1	1	28	5	318	10	346	11						
9	9	63	10	2	0	1	0	1	0	1	25	6	319	14	344	15						
9	23	63	10	14	0	0	0	1	0	1	50	3	309	6	359	7						
9	30	63	10	17	0	0	1	1	1	1	51	6	383	14	414	15						

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT MCNARY DAM, OREGON 81

DATE OF SAMPLE					GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES									
BEGINNING			END								NEUTRALS							
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLOROFORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	OXYGENATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	1	62	10	15	4935	96	23	73	0	7	8	0	1	7	0	3	1	1	3
11	5	62	11	19	4983	92	20	72	0	6	7	1	0	6	0	2	1	1	3
12	3	62	12	17	4999	112	21	91	0	5	8	1	1	6	0	2	1	0	5
1	7	63	1	20	4991	92	16	76	-	-	-	-	-	-	-	-	-	-	-
2	4	63	2	18	4955	98	29	69	1	9	10	1	1	8	0	3	2	1	3
3	4	63	3	18	4993	115	26	89	-	-	-	-	-	-	-	-	-	-	-
4	1	63	4	15	4670	93	36	57	1	10	10	1	1	8	0	4	3	1	7
5	6	63	5	20	4765	104	48	56	-	-	-	-	-	-	-	-	-	-	-
6	3	63	6	17	4965	108	56	52	2	16	11	1	1	9	0	5	6	1	15
7	1	63	7	15	4667	75	33	42	-	-	-	-	-	-	-	-	-	-	-
8	5	63	8	19	4378	102	38	64	1	11	11	1	1	9	0	5	3	1	6
9	2	63	9	16	4990	89	31	58	-	-	-	-	-	-	-	-	-	-	-

PLANKTON POPULATION

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT
MCNARY DAM, OREGON

61

DATE OF SAMPLE			ALGAE (Number per milliliter)								INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS			1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILA-MENT-OUS	COCCOID	FILA-MENT-OUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	1800	40	0	0	0	0	0	370	1410	40	40	77	2	69	1														
10	15	62	400	0	10	10	0	0	0	170	220	170	430																		
11	5	62	4000	0	0	120	0	0	0	290	3620	210	250	92	3	82	3	73	2	73	1	87	1	77	1	85	1				
11	19	62	300	0	0	0	0	0	0	60	200	80	540	84	1																
12	3	62	1100	0	0	0	0	0	0	190	910	0	80	92	1																
12	17	62	100	0	0	0	0	0	0	60	60	60	50																		
1	7	63	1100	0	230	60	0	0	0	380	380	130	110	71	2	17	1														
1	21	63	200	0	0	0	0	40	0	0	140	70	0																		
2	4	63	400	0	20	40	0	0	0	230	110	110	0	68	1																
2	18	63	300	0	20	0	0	0	150	80	60	110	60																		
3	4	63	900	0	0	20	0	20	20	90	700	70	260	77	2																
3	18	63	200	0	0	0	0	20	0	70	70	70	220																		
4	1	63	500	0	0	0	0	40	110	210	170	60	230	71	1																
4	15	63	1100	0	20	60	0	0	20	690	290	250	440	71	2																
5	20	63	3100	0	80	150	0	0	60	1970	800	290	570	69	2	77	2	92	1												
6	10	63	800	0	20	40	0	0	0	260	480	130	920	77	1																
6	17	63	3300	0	20	70	0	90	70	730	2330	200	400	77	4	71	2	82	2	92	1	69	1	84	1						
7	1	63	2400	0	70	110	0	50	0	700	1420	140	500	77	3	82	2	69	1	68	1	71	1								
7	15	63	2100	0	150	0	0	40	0	540	1390	170	500	93	3	84	1														
8	5	63	6200	0	330	620	60	20	0	4140	1010	170	580	71	5	68	3	82	2	25	2	69	2	93	1						
8	19	63	2800	20	20	1250	0	200	20	1120	110	240	70	69	2	38	2	24	2	25	1										
9	2	63	2900	0	20	620	0	70	70	990	1100	1430	620	77	3	68	2	71	2	38	1	69	1	25	1						
9	16	63	1800	0	160	140	0	140	0	750	610	700	750	69	2	84	1														

PLANKTON POPULATION

STATE OREGON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER
STATION LOCATION COLUMBIA RIVER AT
MCNARY DAM, OREGON 081

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml)	MICROINVERTEBRATES																			
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) (Number per ml)	ROTIFERS										CRUSTACEA									
														NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)										NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)						NEMATODES (Identified) (Number per liter)	OTHER AERIAL FORMS (Number per liter)
															1ST		2ND		3RD		4TH		5TH			1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	1	62	47	25	58	17	82	14	9	5	39	-	-	63	17	3	11	3	21	1				16	53	2	50	1	51	1	0	0
10	15	62	47	23	62	18	58	12	82	10	37	10	-	27	11	2	17	2						3	51	1					0	0
11	5	62	47	32	62	12	92	7	56	6	43	-	-	3										1							0	0
11	19	62	47	19	58	16	92	6	95	5	54	20	-	0										0							0	0
12	3	62	47	25	56	15	92	12	62	11	37	-	-	0										0							0	1
12	17	62	47	27	9	8	56	6	92	5	54	-	-	0										0							0	0
1	7	63	82	31	9	7	47	6	71	6	50	-	-	1										0							0	0
1	21	63	82	28	9	10	9	8	47	8	46	10	-	0										0							0	0
2	4	63	27	71	2	5	82	4	92	3	17	-	-	19	11	2	17	1						8	50	2					0	0
2	18	63	9	19	47	16	61	11	82	10	44	-	-	0										0							0	0
3	4	63	61	32	47	22	92	11	95	6	29	-	-	1										0							0	0
3	18	63	9	37	82	14	92	7	47	7	35	-	-	1										0							0	0
4	1	63	82	28	9	19	2	6	92	5	42	-	-	0										0							0	0
4	15	63	9	20	82	13	56	10	47	9	48	-	-	0										0							0	0
5	20	63	61	57	9	21	47	15	82	3	4	-	-	-										-							-	-
6	10	63	95	17	82	12	9	11	61	8	52	-	-	-										-							-	-
6	17	63	35	17	61	14	47	13	95	9	48	-	-	-										-							-	-
7	1	63	9	22	35	19	82	10	47	7	42	-	-	-										-							-	-
7	15	63	35	22	47	15	56	14	92	9	40	-	-	-										-							-	-
8	5	63	82	34	36	32	27	10	47	6	18	-	-	-										-							-	-
8	19	63	58	62	9	10	92	9	47	6	13	-	-	-										-							-	-
9	2	63	9	28	56	17	58	16	47	11	28	-	-	-										-							-	-
9	16	63	56	32	9	13	47	13	56	10	32	-	-	-										-							-	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT MCNARY DAM, OREGON 81

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	1	62	-	-	7.8	-	-	-	-	-	6	70	80	5	*25	22	.0	111	-
10	8	62	-	-	7.4	-	-	-	-	-	13	80	84	0	*25	25	.0	170	-
10	22	62	-	-	7.7	-	-	-	-	-	8	84	88	0	*25	25	.0	142	-
10	29	62	-	-	7.6	-	-	-	-	-	23	66	92	10	*25	25	.0	170	-
11	5	62	-	-	7.8	-	-	-	-	-	5	68	64	5	*25	19	.0	103	-
11	12	62	-	-	7.9	-	-	-	-	-	5	74	80	5	*25	20	.0	125	-
11	19	62	-	-	7.7	-	-	-	-	-	7	76	88	0	*25	24	.0	133	-
11	26	62	-	-	8.0	-	-	-	-	-	4	82	84	5	*25	26	.0	142	-
12	3	62	-	-	7.8	-	-	-	-	-	6	64	80	0	*25	18	.0	105	-
12	10	62	-	-	7.7	-	-	-	-	-	5	70	100	5	*25	20	.0	125	-
12	17	62	-	-	8.0	-	-	-	-	-	5	74	82	5	*25	21	.0	125	-
12	24	62	-	-	7.6	-	-	-	-	-	7	74	92	-	*25	22	.0	140	-
12	31	62	-	-	7.8	-	-	-	-	-	5	68	84	-	*25	18	.0	105	-
1	7	63	-	-	8.0	-	-	-	-	-	5	68	80	-	*25	20	.0	125	-
1	14	63	-	-	7.8	-	-	-	-	-	3	68	76	-	*25	20	.0	108	-
1	21	63	-	-	7.4	-	-	-	-	-	6	76	108	-	*25	22	.0	125	-
1	28	63	-	-	7.9	-	-	-	-	-	7	84	96	-	*25	25	.0	140	-
2	4	63	-	-	7.9	-	-	-	-	-	27	82	104	-	*25	27	.0	170	-
2	11	63	-	-	7.4	-	-	-	-	-	10	64	76	10	570	16	.0	110	-
2	18	63	-	-	7.7	-	-	-	-	-	5	68	72	5	*25	18	.1	110	-
2	25	63	-	-	7.8	-	-	-	-	-	5	80	88	5	*25	19	.0	115	-
3	4	63	-	-	7.4	-	-	-	-	-	5	68	80	5	*25	18	.0	128	-
3	11	63	-	-	7.4	-	-	-	-	-	5	66	80	5	*25	16	.0	124	-
3	18	63	-	-	7.4	-	-	-	-	-	5	72	88	0	*25	18	.0	130	-
3	25	63	-	-	7.0	-	-	-	-	-	4	72	96	5	*25	20	.0	112	-
4	1	63	-	-	7.6	-	-	-	-	-	3	68	84	5	*25	18	.0	120	-
4	8	63	-	-	7.2	-	-	-	-	-	4	64	80	0	*25	16	.0	111	-
4	15	63	-	-	7.2	-	-	-	-	-	5	64	72	5	*25	16	.0	109	-
4	22	63	-	-	7.2	-	-	-	-	-	7	60	72	5	*25	14	.0	97	-
4	29	63	-	-	-	-	-	-	-	-	4	68	80	5	*25	17	.0	102	-
5	6	63	-	-	-	-	-	-	-	-	6	72	76	0	*25	16	.0	135	-
5	13	63	-	-	-	-	-	-	-	-	3	60	68	0	*25	15	.0	94	-
5	20	63	-	-	-	-	-	-	-	-	3	60	68	5	*25	15	.0	92	-
5	27	63	-	-	-	-	-	-	-	-	4	56	64	5	*25	11	.0	87	-
6	10	63	-	-	-	-	-	-	-	-	4	52	52	10	*25	12	.0	53	-
6	17	63	-	-	-	-	-	-	-	-	7	52	72	5	*25	12	.0	83	-
6	24	63	-	-	-	-	-	-	-	-	4	56	68	5	*25	14	.1	130	-
7	1	63	-	-	-	-	-	-	-	-	6	66	76	0	*25	15	.0	89	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER BELOW YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT MCNARY DAM, OREGON 81

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	9	63	-	-	-	-	-	-	-	-	5	54	80	0	*25	12	.0	77	-
7	15	63	-	-	-	-	-	-	-	-	4	54	64	5	*25	13	.0	84	-
7	22	63	-	-	-	-	-	-	-	-	6	60	76	0	*25	18	.0	91	-
7	29	63	-	-	-	-	-	-	-	-	4	56	66	0	*25	14	.0	80	-
8	5	63	-	-	-	-	-	-	-	-	4	60	70	0	*25	15	.0	129	-
8	12	63	-	-	-	-	-	-	-	-	4	60	66	0	*25	14	.0	78	-
8	19	63	-	-	-	-	-	-	-	-	6	60	62	0	*25	15	.0	102	-
8	26	63	-	-	-	-	-	-	-	-	4	62	70	5	*25	16	.0	93	-
9	9	63	-	-	-	-	-	-	-	-	5	68	72	0	*25	18	.0	106	-
9	23	63	-	-	-	-	-	-	-	-	5	72	74	0	*25	20	.0	114	-
9	30	63	-	-	-	-	-	-	-	-	5	74	76	5	*25	21	.0	125	-

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station below McNary Dam, Oregon
Operated by U.S. Geological Survey

STATE Oregon

MAJOR BASIN Pacific Northwest

MINOR BASIN Columbia River below Yakima River

STATION LOCATION Columbia River at
McNary Dam, Oregon

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	91.000	99.800	133.000	111.000	98.200	140.000	120.000	184.000	363.000	320.000	165.000	90.400
2	91.000	97.700	139.000	123.000	99.600	141.000	127.000	207.000	366.000	320.000	150.000	87.300
3	86.400	95.300	134.000	124.000	108.000	137.000	129.000	209.000	351.000	318.000	143.000	94.200
4	82.000	95.300	132.000	122.000	142.000	136.000	138.000	211.000	343.000	302.000	146.000	92.200
5	81.400	103.000	148.000	131.000	176.000	146.000	132.000	217.000	355.000	296.000	150.000	110.000
6	86.900	100.000	138.000	122.000	183.000	134.000	134.000	208.000	370.000	290.000	143.000	96.400
7	86.900	102.000	117.000	119.000	179.000	130.000	129.000	217.000	368.000	284.000	150.000	86.400
8	88.700	96.000	128.000	121.000	180.000	127.000	151.000	231.000	350.000	266.000	134.000	86.500
9	93.500	95.800	128.000	117.000	170.000	123.000	144.000	242.000	356.000	273.000	129.000	85.900
10	97.900	96.000	121.000	124.000	167.000	124.000	150.000	238.000	364.000	267.000	131.000	88.600
11	92.400	95.400	121.000	120.000	157.000	127.000	155.000	241.000	370.000	272.000	122.000	91.700
12	91.000	92.700	123.000	127.000	157.000	123.000	155.000	212.000	376.000	269.000	123.000	92.100
13	104.000	91.400	129.000	127.000	154.000	132.000	148.000	204.000	389.000	259.000	128.000	93.700
14	122.000	97.500	120.000	125.000	146.000	124.000	136.000	198.000	402.000	257.000	133.000	97.100
15	131.000	103.000	113.000	123.000	149.000	117.000	140.000	187.000	412.000	255.000	150.000	97.200
16	136.000	95.800	113.000	125.000	144.000	105.000	139.000	195.000	418.000	240.000	151.000	98.600
17	134.000	91.500	118.000	128.000	143.000	98.400	168.000	200.000	423.000	245.000	144.000	101.000
18	115.000	97.700	129.000	129.000	137.000	111.000	159.000	206.000	425.000	256.000	137.000	106.000
19	105.000	94.100	150.000	130.000	137.000	109.000	169.000	213.000	406.000	260.000	135.000	120.000
20	108.000	103.000	147.000	121.000	143.000	98.900	172.000	220.000	402.000	249.000	127.000	114.000
21	105.000	109.000	134.000	120.000	144.000	112.000	168.000	199.000	404.000	232.000	139.000	94.000
22	104.000	141.000	133.000	130.000	158.000	115.000	179.000	216.000	400.000	208.000	137.000	92.700
23	108.000	136.000	134.000	126.000	153.000	108.000	173.000	232.000	398.000	200.000	131.000	90.600
24	112.000	130.000	136.000	116.000	145.000	110.000	174.000	252.000	390.000	193.000	130.000	96.700
25	120.000	127.000	129.000	107.000	149.000	106.000	170.000	333.000	381.000	199.000	126.000	101.000
26	116.000	129.000	123.000	109.000	140.000	108.000	166.000	347.000	386.000	182.000	120.000	96.700
27	106.000	133.000	115.000	115.000	137.000	117.000	169.000	331.000	373.000	169.000	113.000	92.400
28	108.000	130.000	109.000	105.000	137.000	116.000	170.000	332.000	356.000	158.000	116.000	91.100
29	110.000	157.000	124.000	110.000		116.000	178.000	345.000	330.000	147.000	116.000	90.800
30	108.000	139.000	124.000	106.000		115.000	179.000	355.000	320.000	158.000	115.000	88.900
31	102.000		118.000	103.000		123.000		355.000		175.000	95.500	

COLUMBIA RIVER AT PASCO, WASHINGTON

The Water Pollution Surveillance System station is located above the mouth of the Snake River and below the mouth of the Yakima River. Samples are collected at the municipal water plant intake.

The Hanford Atomic Energy Works is located above this station and its industrial wastes, including reactor cooling waters, are discharged to the Columbia River. The communities of Richland, Pasco, and Kennewick, Washington with populations of approximately 23,500, 15,000 and 14,000 respectively (1960 census) utilize the Columbia River below the Hanford Atomic Works as a source of community water supply.

Richland, Washington discharges approximately 10,200 BOD population equivalents of treated wastes into the Yakima River near its confluence with the Columbia River. This confluence point is located approximately six miles upstream from the Pasco station.

Station Location:	Columbia River At Pasco, Washington
Major Basin:	Pacific Northwest
Minor Basin:	Middle and Lower Snake River
Station at:	46°13' Latitude 119°06' Longitude
Miles above mouth:	329
Activation Date:	November 4, 1957
Sampled by:	Pasco Water Department
Field Analysis by:	Pasco Water Department
Other Cooperating Agencies:	Washington State Department of Health Washington State Pollution Control Commission
Hydrologic Data:	
Nearest pertinent gaging station:	See Remarks
Gaging station operated by:	U. S. Geological Survey
Drainage area at gaging station:	Estimated 122,000 square miles at sampling point
Period of record:	—
Average discharge in record period:	123,000 (estimated)

Maximum discharge in record period: —

Minimum discharge in record period: —

Remarks: Flow at Pasco computed as sum of Columbia River at Trinidad, Washington plus Yakima River at Kiona, Washington

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.10	.15
	Na	4.0	3.9
	K	1.7	.9
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	66	76
	Cd	*1	*2
	As	*11	*8
	B	18	16
	P	99	*4
	Fe	146	3
	Mo	11	5
	Mn	2	*1
	Al	—	23
	Be	*.03	*.02
	Cu	28	15
	Ag	*.2	*.2
	Ni	15	11
	Co	*2	*1
	Pb	*3	6
	Cr	6	8
	V	*1	*4
	Ba	36	35
	Sr	94	45

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.5	.2	April to June	2.4	.3
January to March	2.3	.3	July to September	2.7	.3

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l
10/5 - 10/13/62	DDT	
11/3 - 11/10/62	DDT	
12/5 - 12/13/62	DDT	
8/13 - 8/19/63	DDT	0.002

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.

See page 21.

RADIOACTIVITY DETERMINATIONS

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE AND LOWER SNAKE RIVER

STATION LOCATION COLUMBIA RIVER AT PASCO, WASHINGTON

9

DATE SAMPLE TAKEN			DATE OF DETERMINATION		RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON					
					ALPHA						BETA						DATE OF DETERMINATION	GROSS ACTIVITY				
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL			ALPHA		BETA		
MO.	DAY	YR	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO. DAY	pc/g	±	pc/g	±
10	1	62	10	26	0	0	2	1	2	1	60	7	382	14	442	16					
10	8	62	11	7	-	-	-	-	-	-	164	8	454	13	618	15					
10	15	62	11	9	-	-	-	-	-	-	25	6	273	11	298	13					
10	22	62	11	20	0	0	1	1	1	1	31	6	236	11	267	13					
10	29	62	12	19	-	-	-	-	-	-	20	6	181	9	201	11					
11	5	62	11	29	-	-	-	-	-	-	24	7	381	10	405	12					
11	13	62	12	26	-	-	-	-	-	-	22	4	416	9	438	10					
11	19	62	12	6	0	0	0	1	0	1	50	6	315	11	365	13					
11	26	62	12	15	0	0	1	1	1	1	32	5	708	13	740	14					
12	3	62	1	3	0	0	0	1	0	1	36	7	344	12	380	14					
12	10	62	1	7	0	0	0	1	0	1	22	4	417	7	439	8					
12	17	62	1	30	-	-	-	-	-	-	103	8	226	10	329	13					
12	31	62	1	16	-	-	-	-	-	-	38	6	540	14	578	15					
1	7	63	1	25	0	0	1	1	1	1	58	6	617	15	675	16					
1	14	63	1	30	-	-	-	-	-	-	15	6	283	11	298	13					
1	21	63	2	6	-	-	-	-	-	-	81	8	520	14	601	16					
2	4	63	3	1	0	1	0	1	0	1	19	7	313	12	332	14					
2	11	63	3	4	-	-	-	-	-	-	45	4	260	6	305	7					
2	18	63	3	11	-	-	-	-	-	-	29	3	248	6	277	6					
2	25	63	3	18	-	-	-	-	-	-	32	3	455	7	487	8					
3	4	63	3	25	0	0	1	1	1	1	52	4	576	9	628	10					
3	11	63	4	1	-	-	-	-	-	-	50	3	647	8	697	8					
3	18	63	4	1	-	-	-	-	-	-	108	4	1033	10	1141	11					
3	25	63	4	18	-	-	-	-	-	-	68	7	632	16	700	17					
4	2	63	4	25	-	-	-	-	-	-	135	8	761	18	896	20					
4	15	63	4	29	-	-	-	-	-	-	196	5	806	9	1002	10					
4	23	63	5	15	-	-	-	-	-	-	68	7	399	14	467	16					
4	29	63	5	15	-	-	-	-	-	-	124	8	456	14	580	16					
5	6	63	6	7	1	1	1	1	2	1	55	7	262	11	317	13					
5	13	63	6	13	0	1	1	1	1	1	135	9	415	14	550	17					
5	20	63	6	7	-	-	-	-	-	-	55	7	247	12	302	14					
5	27	63	6	12	-	-	-	-	-	-	53	7	219	11	272	13					
6	3	63	6	19	0	0	0	1	0	1	31	6	187	10	218	12					
6	10	63	6	25	-	-	-	-	-	-	53	7	219	11	272	13					
6	17	63	7	3	-	-	-	-	-	-	28	7	157	10	185	12					
6	24	63	7	15	-	-	-	-	-	-	21	3	175	5	196	6					
7	1	63	7	17	0	0	0	0	0	0	34	6	223	11	257	13					
7	8	63	7	31	-	-	-	-	-	-	14	5	217	11	231	12					
7	15	63	8	7	-	-	-	-	-	-	20	6	93	9	113	12					
7	22	63	8	12	0	0	0	1	0	1	28	3	287	6	315	7					

RADIOACTIVITY DETERMINATIONS

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE AND LOWER SNAKE RIVER

STATION LOCATION COLUMBIA RIVER AT PASCO, WASHINGTON

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
7	29	63	8	14	-	-	-	-	-	-	58	7	471	14	529	16						
8	5	63	8	27	1	1	0	1	1	1	38	6	422	14	460	15						
8	12	63	8	27	-	-	-	-	-	-	65	7	604	16	669	17						
8	19	63	9	16	-	-	-	-	-	-	69	3	465	7	534	8						
8	26	63	9	17	-	-	-	-	-	-	44	7	412	14	456	16						
9	3	63	9	17	0	0	0	1	0	1	44	6	654	17	698	18						
9	9	63	10	1	-	-	-	-	-	-	52	4	884	11	936	12						
9	16	63	10	2	-	-	-	-	-	-	34	6	697	17	731	18						
9	23	63	10	14	-	-	-	-	-	-	44	3	502	7	546	8						
9	30	63	10	17	-	-	-	-	-	-	35	6	573	16	608	17						

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE AND LOWER SNAKE RIVER

STATION LOCATION COLUMBIA RIVER AT PASCO, WASHINGTON

9

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	5	62	10	13	4960	65	13	52	1	4	3	0	0	3	0	1	1	0	3
11	3	62	11	10	5040	79	21	58	0	7	6	0	0	6	0	2	1	1	4
12	5	62	12	13	5490	72	18	54	1	5	5	0	0	5	0	2	1	0	4
1	3	63	1	11	5480	79	17	62	–	–	–	–	–	–	–	–	–	–	–
1	30	63	2	6	4670	83	20	63	1	4	9	2	1	6	0	2	1	0	3
2	15	63	2	21	4700	107	25	82	–	–	–	–	–	–	–	–	–	–	–
3	20	63	3	29	2940	132	23	109	1	6	10	3	1	6	0	2	1	1	2
4	10	63	4	22	2200	162	62	100	–	–	–	–	–	–	–	–	–	–	–
5	9	63	5	24	2950	137	54	83	2	16	14	2	1	10	1	7	5	1	9
6	12	63	6	17	570*	–	–	–	–	–	–	–	–	–	–	–	–	–	–
7	2	63	7	7	1680	155	61	94	3	19	14	2	1	11	0	10	6	1	8
7	22	63	7	29	1480	204	69	135	–	–	–	–	–	–	–	–	–	–	–
8	13	63	8	19	2090	112	35	77	1	11	11	1	1	9	0	4	3	1	4
9	7	63	9	19	2770	143	45	98	2	12	13	1	1	11	0	5	4	1	8

* LOW FLOW

PLANKTON POPULATION

STATE WASHINGTON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN MIDDLE AND LOWER SNAKE RIVER
STATION LOCATION COLUMBIA RIVER AT
PASCO, WASHINGTON 9

DATE OF SAMPLE			ALGAE (Number per milliliter)										MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																			
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS		INERT DIATOM SHELLS		1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	2100	0	0	410	0	40	60	410	1180	40	120	92	1	25	1	71	1	38	1											
10	15	62	300	0	20	10	0	0	0	70	240	90	200																			
11	5	62	200	0	0	20	0	0	0	50	150	80	230																			
11	19	62	200	0	20	0	0	0	0	80	80	80	320																			
12	3	62	600	0	0	0	0	0	0	80	500	0	80																			
12	10	62	700	0	150	0	0	0	0	250	310	0	0																			
12	17	62	200	0	0	0	0	0	0	90	70	0	200																			
12	31	62	200	0	0	0	0	0	0	20	190	60	130																			
1	21	63	300	0	0	0	0	0	0	20	250	60	210																			
2	4	63	300	0	0	0	0	0	0	40	210	40	20																			
2	18	63	600	0	40	150	0	0	230	20	190	40	270																			
3	4	63	300	0	0	0	0	20	0	40	200	0	110	77	1																	
3	25	63	400	0	0	0	0	0	0	130	260	20	200																			
4	15	63	2100	0	190	20	0	0	0	1160	690	460	270	71	3	88	1	17	1	73	1	92	1									
5	6	63	2400	0	20	60	0	20	20	1030	1280	80	500	69	3	77	3	92	1													
5	20	63	1800	0	0	0	0	0	0	950	860	180	640	69	3	77	2	84	1													
6	3	63	3100	0	0	130	0	0	20	1260	1680	400	400	69	3	77	2															
6	17	63	1900	0	0	70	0	90	20	500	1270	110	250	77	2	69	2	92	2	88	1	93	1									
7	1	63	2400	0	50	70	0	70	20	430	1810	90	430	92	2	82	2	77	2	71	1											
7	15	63	2500	0	270	0	0	20	0	540	1660	40	440	93	3	82	2	14	1	69	1	71	1									
8	5	63	6300	0	310	790	0	80	0	3770	1390	230	790	71	4	68	4	82	2	25	2	22	1	69	1	92	1	38	1			
8	19	63	2500	70	70	410	20	0	0	970	970	220	170	69	3	84	1	88	1	77	1											
9	3	63	1900	0	0	280	0	40	0	690	880	410	750	88	2	68	2	71	1	92	1	38	1	77	1							
9	23	63	1000	0	0	270	0	200	0	230	290	160	430	51	1																	

PLANKTON POPULATION

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE AND LOWER SNAKE RIVER

STATION LOCATION COLUMBIA RIVER AT PASCO, WASHINGTON 009

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See last for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml.)	MICROINVERTEBRATES																											
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) (Number per ml.)	ROTIFERS															CRUSTACEA										NEMATODES (Identifiable) (Number per liter)	OTHER ANIMAL FORMS (Number per liter)
											OTHER SPECIES PERCENT		NUMBER PER LITER	GENERA AND COUNT LEVEL (See last for Codes)														NUMBER PER LITER	GENERA AND COUNT LEVEL (See last for Codes)											
															1ST		2ND		3RD		4TH		5TH						1ST		2ND		3RD					
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT					GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL					GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL				
10	1	62	62	28	82	19	92	9	26	6	38	-	-	0											0									0	0
10	15	62	62	25	82	14	47	11	92	8	42	-	-	3											0									0	0
11	5	62	62	40	47	6	92	6	82	5	43	-	-	0											0									0	0
11	19	62	62	52	47	14	92	7	2	4	23	-	-	0											0									0	0
12	3	62	62	16	2	16	46	8	92	8	52	-	-	0											0									0	1
12	10	62	9	17	62	17	71	7	51	6	53	60	-	0											0									0	0
12	17	62	56	29	82	7	52	6	80	5	53	-	-	0											0									0	0
12	31	62	62	25	92	11	47	7	71	5	52	-	-	0											0									0	0
1	21	63	2	15	62	14	92	9	51	8	54	-	-	0											0									0	0
2	4	63	2	25	82	20	9	4	46	4	47	-	-	0											0									0	0
2	18	63	9	22	92	12	47	10	62	6	50	-	-	0											0									0	0
3	4	63	92	15	9	15	46	11	1	10	49	40	-	1											0									0	0
3	25	63	82	30	9	24	2	9	62	6	31	-	-	-											-									-	-
4	15	63	82	51	70	6	9	6	2	6	31	-	-	0											1									0	0
5	6	63	9	34	61	21	47	11	62	8	26	-	-	-											-									-	-
5	20	63	61	42	47	28	9	14	92	6	10	-	-	-											-									-	-
6	3	63	9	16	95	14	57	10	92	9	51	-	-	-											-									-	-
6	17	63	61	17	9	15	92	13	47	12	43	-	-	-											-									-	-
7	1	63	35	16	92	15	47	12	95	12	45	-	-	-											-									-	-
7	15	63	35	40	47	17	56	11	62	5	27	-	-	-											-									-	-
8	5	63	47	21	35	20	82	15	27	7	37	-	-	-											-									-	-
8	19	63	47	23	58	21	71	15	9	12	29	-	-	-											-									-	-
9	3	63	47	53	9	24	70	7	58	5	11	-	-	-											-									-	-
9	23	63	47	38	62	7	58	7	56	6	42	-	-	-											-									-	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE AND LOWER SNAKE RIVER

STATION LOCATION COLUMBIA RIVER AT PASCO, WASHINGTON

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	1	62	18.0	9.4	8.1	.5	-	1.7	2.1	-	-	70	66	6	*25	-	-	-	50
10	8	62	18.0	10.4	8.1	.4	-	1.7	1.9	-	-	66	70	8	*25	-	-	-	120
10	15	62	15.3	9.7	8.2	.6	-	1.7	1.9	-	5	70	68	7	*25	20	-	-	280
10	22	62	15.9	10.1	8.2	1.0	-	1.7	1.9	-	-	68	70	6	*25	-	-	-	73
10	29	62	15.2	10.1	8.1	1.1	-	1.6	1.9	-	-	61	68	7	*25	-	-	-	33
11	5	62	14.8	9.7	8.1	.2	-	1.7	1.9	-	-	65	66	6	*25	-	-	-	140
11	12	62	13.5	10.5	8.2	1.6	-	1.7	2.0	-	-	64	66	6	*25	-	-	-	-
11	13	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67
11	19	62	13.0	9.8	7.9	1.2	-	1.7	1.8	-	4	60	84	0	*25	13	.0	93	20
11	26	62	11.5	10.8	8.2	1.5	-	1.7	1.9	-	3	56	76	0	*25	14	.0	90	*3
12	2	62	10.1	11.2	8.1	1.8	-	1.7	1.9	-	3	58	80	0	*25	13	.0	125	-
12	3	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73
12	10	62	9.9	11.4	-	1.4	-	1.6	1.8	-	-	68	68	7	*25	-	-	-	5
12	17	62	10.7	10.6	7.6	1.2	-	1.6	1.8	-	-	-	-	-	-	-	-	-	47
12	24	62	9.2	11.3	8.1	1.3	-	1.8	2.0	-	-	63	70	6	*25	-	-	-	-
12	31	62	8.2	11.4	8.1	.9	-	1.7	1.8	-	7	58	84	-	*25	19	.0	-	10
1	7	63	5.2	11.7	7.9	1.4	-	1.7	1.8	-	4	64	76	-	*25	16	.0	90	10
1	14	63	5.0	12.3	7.8	1.5	-	1.6	1.8	-	3	60	80	-	*25	15	.0	90	47
1	21	63	4.9	12.3	7.8	1.9	-	1.6	1.8	-	3	70	76	-	*25	16	.0	100	47
1	28	63	4.5	13.0	8.0	2.7	-	1.5	1.8	-	2	64	80	-	*25	15	.0	94	5
2	4	63	4.8	13.0	7.8	2.5	-	1.6	1.7	-	3	70	80	5	*25	15	.0	90	500
2	11	63	5.2	12.7	7.6	2.2	-	1.8	2.1	-	3	64	40	0	*25	14	.0	90	83
2	18	63	4.9	13.5	7.7	2.2	-	1.7	1.9	-	-	-	-	-	-	-	-	-	63
2	25	63	4.9	13.6	7.7	2.8	-	1.7	1.8	-	3	68	84	0	*25	16	.0	110	670
3	4	63	5.4	13.8	8.1	2.7	-	1.8	1.9	-	2	66	84	0	*25	22	.0	94	200
3	11	63	5.8	13.0	7.5	3.1	-	1.6	1.8	-	2	64	80	0	*25	16	.0	104	20
3	18	63	6.0	12.2	7.4	2.6	-	1.6	1.9	-	3	64	80	0	*25	15	.0	90	*3
3	25	63	7.8	12.2	7.0	2.6	-	1.7	2.1	-	3	64	80	0	*25	17	.0	118	63
4	1	63	7.1	11.9	7.5	2.1	-	1.9	2.2	-	4	64	76	0	*25	17	.0	100	*3
4	8	63	8.4	11.7	7.9	2.2	-	2.0	2.3	-	7	64	80	0	*25	18	.1	92	30
4	15	63	8.4	12.3	7.3	3.4	-	1.7	2.0	-	4	68	-	0	*25	18	.0	110	70
4	22	63	8.5	11.4	7.4	1.6	-	1.8	2.2	-	5	68	84	0	*25	15	.0	90	53
4	29	63	10.4	12.3	-	1.8	-	1.7	2.0	-	2	68	84	0	*25	16	.0	87	57
5	6	63	10.2	12.0	8.1	2.6	-	1.7	2.0	-	6	72	84	0	*25	23	.0	142	57
5	13	63	11.1	11.2	8.2	.8	-	1.7	2.0	-	3	64	84	0	*25	23	.0	116	-
5	20	63	11.2	11.9	8.3	3.5	-	1.7	2.2	-	3	54	72	5	*25	16	.0	78	-
5	27	63	12.9	11.0	8.1	2.6	-	2.0	2.6	-	4	64	76	5	*25	14	.0	125	30
6	3	63	13.3	11.0	8.1	2.1	-	2.1	2.5	-	3	58	68	0	*25	13	.0	96	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE: WASHINGTON
MAJOR BASIN: PACIFIC NORTHWEST
MINOR BASIN: MIDDLE AND LOWER SNAKE RIVER
STATION LOCATION: COLUMBIA RIVER AT PASCO, WASHINGTON

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
6	10	63	14.0	10.2	8.2	2.1	–	2.1	2.5	–	4	58	72	5	*25	13	.0	68	100
6	17	63	14.2	10.6	8.4	2.1	–	1.7	2.0	–	6	56	68	5	*25	12	.0	72	60
6	24	63	14.6	10.6	8.3	2.4	–	1.6	2.0	–	4	62	68	5	*25	14	.0	92	100
7	1	63	15.0	9.0	8.1	1.4	–	1.7	2.2	–	4	54	80	0	*25	14	.0	95	67
7	8	63	16.5	10.3	8.2	2.1	–	1.7	2.3	–	4	58	80	0	*25	13	.0	88	100
7	15	63	16.5	9.7	–	1.3	–	8.7	2.5	–	3	58	72	0	*25	14	.0	86	100
7	22	63	18.1	9.5	8.2	2.4	–	2.0	2.5	–	5	58	72	0	*25	14	.2	90	50
7	29	63	19.0	9.4	8.3	1.1	–	1.8	2.5	–	4	56	70	0	*25	16	.0	80	330
8	5	63	19.6	9.9	8.2	2.4	–	1.8	2.4	–	5	60	68	5	*25	14	.0	77	10
8	12	63	20.5	8.2	8.3	.3	–	1.8	2.5	–	6	58	70	0	*25	17	.0	82	130
8	19	63	19.6	9.7	8.1	.9	–	1.8	2.4	–	8	60	68	0	*25	15	.0	83	37
8	26	63	18.7	9.7	8.2	.9	–	1.9	2.3	–	3	60	70	0	*25	16	.0	97	120
9	2	63	19.6	8.2	8.3	.3	–	1.7	2.4	–	2	60	70	5	*25	14	.0	96	110
9	9	63	19.7	9.5	8.2	1.3	–	1.8	2.7	–	3	52	70	0	*25	16	.0	95	120
9	16	63	19.4	8.9	–	.9	–	1.7	2.2	–	3	60	76	5	*25	19	.0	101	100
9	23	63	19.2	8.7	8.2	.5	–	1.7	2.3	–	4	64	70	0	*25	16	.0	94	10
9	30	63	19.6	9.3	8.2	.9	–	1.6	2.3	–	4	62	68	5	*25	16	.0	92	330

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Computed Data for Pasco, Washington
Supplied by U.S. Geological Survey

STATE: Washington

MAJOR BASIN: Pacific Northwest

MINOR BASIN: Middle and Lower Snake River

STATION LOCATION: Columbia River at Pasco, Washington

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	64.300	65.700	92.900	84.900	76.300	90.300	91.400	132.000	235.000	244.000	129.000	75.600
2	61.600	69.600	93.200	93.600	76.200	91.100	92.300	133.000	232.000	252.000	122.000	67.600
3	61.500	72.500	92.600	89.000	65.900	90.500	94.100	134.000	232.000	246.000	122.000	71.600
4	61.300	68.500	92.200	95.200	84.700	92.100	95.900	132.000	237.000	241.000	121.000	74.500
5	63.200	69.400	88.200	85.600	86.200	85.600	94.900	134.000	242.000	243.000	119.000	77.700
6	65.100	69.300	86.300	73.600	93.000	89.700	91.000	137.000	236.000	240.000	115.000	71.700
7	65.000	68.400	82.500	87.300	94.400	91.600	91.100	140.000	231.000	230.000	112.000	69.700
8	65.900	72.400	79.000	83.100	85.700	95.400	89.200	147.000	241.000	230.000	109.000	67.700
9	64.800	69.400	82.300	84.900	95.500	90.500	94.600	153.000	248.000	236.000	109.000	71.600
10	60.000	67.400	89.500	90.400	104.000	90.600	99.400	161.000	259.000	231.000	109.000	73.600
11	62.100	64.400	86.300	97.200	104.000	95.400	101.000	138.000	269.000	231.000	109.000	75.600
12	73.400	66.400	83.500	98.100	105.000	98.200	97.500	126.000	282.000	220.000	110.000	74.600
13	71.000	67.500	82.700	99.000	102.000	90.400	91.200	120.000	290.000	219.000	114.000	71.600
14	66.100	63.500	83.200	96.100	99.900	82.500	90.300	106.000	302.000	220.000	118.000	73.600
15	66.400	60.500	82.200	98.300	99.700	75.200	93.500	107.000	305.000	210.000	119.000	73.600
16	67.400	65.600	86.400	99.700	100.000	68.200	98.200	114.000	307.000	213.000	120.000	77.600
17	73.000	69.400	91.200	102.000	92.200	65.100	103.000	116.000	309.000	219.000	118.000	84.800
18	67.200	65.400	85.900	89.800	91.100	72.900	112.000	117.000	306.000	225.000	113.000	88.000
19	66.200	64.400	89.800	87.600	93.900	72.200	114.000	118.000	303.000	224.000	111.000	93.900
20	65.800	68.200	88.300	90.400	94.400	65.600	116.000	124.000	299.000	213.000	111.000	77.900
21	64.600	74.800	90.000	94.900	96.900	64.600	119.000	137.000	296.000	203.000	112.000	67.800
22	69.500	70.800	87.800	93.700	96.200	65.400	122.000	192.000	293.000	200.000	112.000	67.600
23	70.300	83.900	87.700	84.100	96.200	65.500	120.000	218.000	290.000	184.000	112.000	69.600
24	84.200	89.500	87.600	84.500	94.200	63.700	119.000	216.000	290.000	175.000	108.000	71.600
25	85.200	87.500	84.400	83.600	94.600	70.700	115.000	209.000	290.000	153.000	101.000	71.700
26	76.200	91.000	89.900	80.600	95.000	74.900	119.000	206.000	288.000	137.000	95.800	71.700
27	77.100	146.000	85.700	75.400	90.600	73.800	122.000	205.000	284.000	132.000	88.800	71.800
28	77.000	97.100	85.700	75.200	90.000	76.800	123.000	220.000	263.000	132.000	87.900	66.700
29	79.000	98.100	91.900	79.000		81.800	123.000	228.000	250.000	134.000	84.800	66.700
30	70.900	98.100	80.900	81.300		88.000	124.000	230.000	247.000	133.000	83.700	70.600
31	67.800		79.800	77.200		88.200		234.000		133.000	80.800	

Computed as sum of Columbia River at Trinidad, Washington plus Yakima River at Kiona, Washington.

COLUMBIA RIVER AT WENATCHEE, WASHINGTON

This station is located at the plant intake of the Wenatchee Works of the Aluminum Company of America, some 70 miles upstream from the Hanford Atomic Works. Wenatchee and East Wenatchee discharge wastes with a total of about 13,000 BOD population equivalents to the Columbia River about 12 miles upstream. Other industries in the area include irrigated agriculture, ore smelting, and meat processing.

Grand Coulee Dam and Franklin D. Roosevelt Lake are about halfway between this station and the next Surveillance System station at Northport, Washington. The Spokane River is confluent to the Columbia in Franklin D. Roosevelt Lake.

736-491 O—64——6

Station Location: Columbia River At Wenatchee, Washington

Major Basin: Pacific Northwest

Minor Basin: Columbia River above Yakima River

Station at: 47°21' Latitude 120°07' Longitude

Miles above mouth: 458

Activation Date: October 6, 195ª

Sampled by: Aluminum Company of America

Field Analysis by: Aluminum Company of America

Other Cooperating Agencies: Washington State Department of Health
Washington State Pollution Control Commission

Hydrologic Data:

Nearest pertinent gaging station: At Trinidad, Washington

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 89,700 square miles

Period of record: 1913 to Present

Average discharge in record period: 120,400 cfs.

Maximum discharge in record period: 692,000 cfs.

Minimum discharge in record period: 4,120 cfs.

Remarks: Flow regulated by Rock Island, Rocky Reach, Grand Coulee, and St. Joseph Dams. Irrigation diversions above station for about 500,000 acres. Reservoirs on major tributaries.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.15	.25
	Na	2.0	3.4
	K	1.1	.9
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	12	24
	Cd	*1	*2
	As	*7	*10
	B	7	10
	P	2	27
	Fe	70	27
	Mo	*1	5
	Mn	*.4	2
	Al	—	27
	Be	*.02	*.02
	Cu	13	13
	Ag	*.1	.2
	Ni	*1	*2
	Co	*1	*2
	Pb	*2	8
	Cr	*1	*2
	V	*1	*4
	Ba	34	33
	Sr	91	43

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.6	.2	April to June	1.1	.2
January to March	—	—	July to September	—	—

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l
10/11 - 12/62 (c)	DDT	

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER ABOVE YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT WENATCHEE, WASHINGTON 10

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	2	62	11	15	-	-	-	-	-	-	0	6	2	6	2	8						
10	9	62	12	14	-	-	-	-	-	-	3	6	5	6	8	9						
10	16	62	12	17	-	-	-	-	-	-	3	4	17	6	20	7						
10	23	62	11	17	0	0	0	1	0	1	0	6	6	6	6	8						
10	30	62	12	20	-	-	-	-	-	-	5	6	13	6	18	8						
11	27	62	12	15*	1	1	2	1	3	1	0	7	10	5	10	9						
12	31	62	1	15*	0	0	0	1	0	1	3	6	7	6	10	8						
1	29	63	2	21*	0	1	0	1	0	1	4	7	23	7	27	10						
2	26	63	3	18*	0	1	0	1	0	1	3	3	11	3	14	4						
3	26	63	4	10*	0	0	3	1	3	1	3	6	17	7	20	9						
4	30	63	5	20*	0	1	1	1	1	1	12	3	20	4	32	5						
5	28	63	6	13*	0	0	1	1	1	1	6	6	16	7	22	9						
6	25	63	7	15*	0	0	0	1	0	1	0	7	11	4	11	8						
7	30	63	8	16*	0	1	1	1	1	1	4	6	10	7	14	9						
8	27	63	9	23*	0	1	0	1	0	1	16	4	15	3	31	5						
9	23	63	10	17*	0	0	1	1	1	1	0	6	14	7	14	9						

PLANKTON POPULATION

STATE WASHINGTON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN COLUMBIA RIVER ABOVE YAKIMA RIVER
STATION LOCATION COLUMBIA RIVER AT
WENATCHEE, WASHINGTON 10

DATE OF SAMPLE			ALGAE (Number per milliliter)											INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS						1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	2	62	1100	0	0	40	0	0	0	170	890	0	170	92	1	79	2																
10	16	62	1200	170	0	40	0	60	0	330	620	80	210	3	1																		
11	6	62	800	0	0	0	0	0	0	170	620	40	80	69	1																		
11	20	62	200	0	0	0	0	0	0	80	80	150	200																				
12	4	62	100	0	0	0	0	0	0	50	80	30	80																				
12	18	62	200	0	0	0	0	0	0	50	160	50	110																				
1	8	63	1000	0	0	40	0	20	0	80	840	40	400	88	2																		
1	22	63	100	0	0	0	0	0	10	30	100	10	110																				
2	5	63	100	0	10	0	0	0	0	10	70	30	110																				
2	19	63	900	0	130	0	0	0	210	250	360	60	60	77	1	68	1																
3	5	63	300	0	0	0	0	0	20	20	220	70	220	77	1																		
3	19	63	200	0	0	0	0	0	0	40	180	0	290																				
4	2	63	100	0	0	0	0	0	0	60	80	20	140																				
4	16	63	200	0	0	0	0	0	0	130	110	90	40																				
5	6	63	1100	0	40	10	0	0	0	630	460	1[illegible]0	380	69	2	77	2																
5	21	63	2300	0	20	20	0	20	0	1360	860	18[illegible]	660	69	4	77	3																
6	4	63	700	0	0	20	0	20	0	240	400	70	260	69	1	84	1																
6	18	63	700	0	0	20	0	50	0	180	450	180	200	77	1																		
7	2	63	2200	20	290	400	0	90	20	310	1060	330	480	82	2	26	1	15	1	77	1												
7	16	63	1800	0	40	70	0	20	0	260	1360	130	770	82	1																		
8	6	63	500	0	0	60	0	0	20	80	350	100	440																				
8	20	63	1200	0	0	40	0	0	0	90	1060	0	290	77	1	92	1	84	1														
9	3	63	700	0	20	130	0	0	0	150	430	240	650	84	1																		
9	17	63	700	0	0	90	0	50	0	200	320	690	920	69	1																		

PLANKTON POPULATION

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER ABOVE YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT WENATCHEE, WASHINGTON 010

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	MICROINVERTEBRATES																				
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) Number per ml.	ROTIFERS											CRUSTACEA							NEMATODES (Identifiable) Number per liter	OTHER ANIMAL FORMS (Number per liter)
														NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)										NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)							
															1ST		2ND		3RD		4TH		5TH			1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	2	62	47	27	82	20	62	12	1	5	36	-	-	140	15	5									0							7	0
10	16	62	62	33	47	10	82	9	16	6	42	100	-	179	15	6									0							0	0
11	6	62	62	34	47	11	2	10	70	4	41	-	-	72	15	4									0							1	1
11	20	62										50	-	3											0							0	0
12	4	62	2	15	62	11	46	8	47	5	61	50	-	2											0							0	0
12	18	62	2	18	47	7	62	7	70	6	62	-	-	3											0							0	0
1	8	63	62	23	2	6	71	6	72	5	60	-	-	0											0							0	0
1	22	63	82	34	71	7	2	7	9	6	46	30	-	1											0							0	0
2	5	63	47	17	2	10	9	9	92	7	57	10	-	0											0							0	0
2	19	63	9	26	61	17	47	12	92	10	35	20	-	2											0							0	0
3	5	63	9	31	92	14	82	10	61	8	37	-	-	0											0							0	0
3	19	63	9	20	82	15	92	9	2	8	48	-	-	2											0							0	0
4	2	63	82	35	2	8	9	8	56	6	43	-	-	1											0							0	0
4	16	63										-	-	0											0							0	0
5	6	63	9	39	61	35	47	8	27	3	15	-	-	-											-							-	-
5	21	63	61	45	9	15	47	9	95	8	23	-	-	-											-							-	-
6	4	63	95	21	9	14	57	14	82	12	39	-	-	-											-							-	-
6	16	63	47	19	92	17	61	14	95	10	40	-	-	-											-							-	-
7	2	63	35	41	9	22	92	5	47	5	27	-	-	-											-							-	-
7	16	63	35	36	27	7	92	7	95	7	43	-	-	-											-							-	-
8	6	63										-	-	-											-							-	-
8	20	63	47	53	58	7	9	6	46	4	30	-	-	-											-							-	-
9	3	63	47	32	52	10	9	6	2	5	47	-	-	-											-							-	-
9	17	63	27	15	47	14	70	8	92	8	55	-	-	-											-							-	-

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER ABOVE YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT WENATCHEE, WASHINGTON 10

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	2	62	10	9	3780	89	27	62	–	–	–	–	–	–	–	–	–	–	–
11	6	62	11	13	3988	88	31	57	–	–	–	–	–	–	–	–	–	–	–
12	4	62	12	11	3900	73	31	42	–	–	–	–	–	–	–	–	–	–	–
12	4	62		*	11668	82	29	53	1	7	11	4	1	6	0	3	1	0	6
1	8	63	1	22	3500	128	34	94	–	–	–	–	–	–	–	–	–	–	–
2	5	63	2	12	3747	77	17	60	0	4	9	3	1	5	0	1	0	0	3
3	5	63	3	12	4564	89	25	64	–	–	–	–	–	–	–	–	–	–	–
4	2	63	4	9	4065	89	38	51	2	10	16	6	2	7	1	3	2	0	5
4	30	63	5	7	3758	84	37	47	–	–	–	–	–	–	–	–	–	–	–
6	4	63	6	11	4065	99	45	54	4	12	13	5	1	7	0	5	3	1	7
7	2	63	7	10	4855	100	45	55	–	–	–	–	–	–	–	–	–	–	–
8	6	63	8	13	4393	136	67	69	1	13	39	24	5	9	1	6	3	1	4
9	3	63	9	10	4122	126	60	66	–	–	–	–	–	–	–	–	–	–	–

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER ABOVE YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT WENATCHEE, WASHINGTON

10

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	2	62	16.8	–	8.0	–	–	–	–	–	–	56	62	–	–	–	–	57	150
10	9	62	15.8	–	7.9	–	–	–	–	–	–	56	64	–	–	–	–	72	10
10	16	62	14.7	–	7.9	–	–	–	–	–	–	50	55	–	–	–	–	67	150
10	23	62	15.5	–	8.2	–	–	–	–	–	–	55	60	–	–	–	–	84	30
10	30	62	15.0	–	7.9	–	–	–	–	–	–	49	61	–	–	–	–	77	100
11	6	62	14.2	–	7.8	–	–	–	–	–	–	54	63	–	–	–	–	73	140
11	13	62	13.0	–	7.8	–	–	–	–	–	–	56	63	–	–	–	–	78	1200
11	20	62	12.3	–	7.9	–	–	–	–	–	–	57	65	–	–	–	–	86	400
11	27	62	11.0	–	7.9	–	–	–	–	–	–	49	67	–	–	–	–	63	80
12	4	62	10.5	–	7.9	–	–	–	–	–	–	56	66	–	–	–	–	71	–
12	11	62	10.5	–	8.0	–	–	–	–	–	–	51	63	–	–	–	–	74	140
12	18	62	10.0	–	7.8	–	–	–	–	–	–	56	63	–	–	–	–	72	1000
12	24	62	8.7	–	7.9	–	–	–	–	–	–	55	67	–	–	–	–	89	43
12	31	62	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	93
1	2	63	7.3	–	8.0	–	–	–	–	–	–	57	67	–	–	–	–	89	–
1	8	63	7.8	–	7.8	–	–	–	–	–	–	58	67	–	–	–	–	93	150
1	15	63	5.6	–	7.9	–	–	–	–	–	–	61	68	–	–	–	–	100	5000
1	22	63	5.5	–	7.8	–	–	–	–	–	–	61	67	–	–	–	–	69	10
1	29	63	4.4	–	8.0	–	–	–	–	–	–	61	70	–	–	–	–	72	30
2	5	63	4.1	–	7.9	–	–	–	–	–	–	59	67	–	–	–	–	101	300
2	12	63	4.5	–	8.0	–	–	–	–	–	–	60	68	–	–	–	–	84	63
2	19	63	3.7	–	8.0	–	–	–	–	–	–	60	68	–	–	–	–	90	60
2	26	63	3.8	–	8.0	–	–	–	–	–	–	56	67	–	–	–	–	95	40
3	5	63	3.6	–	8.0	–	–	–	–	–	–	62	66	–	–	–	–	95	40
3	12	63	3.8	–	8.0	–	–	–	–	–	–	62	68	–	–	–	–	95	57
3	19	63	4.0	–	7.8	–	–	–	–	–	–	63	69	–	–	–	–	73	20
3	26	63	5.0	–	7.8	–	–	–	–	–	–	60	69	–	–	–	–	106	37
4	2	63	4.5	–	7.9	–	–	–	–	–	–	58	70	–	–	–	–	94	700
4	9	63	5.1	–	8.0	–	–	–	–	–	–	60	69	–	–	–	–	95	10
4	16	63	6.2	–	7.9	–	–	–	–	–	–	62	70	–	–	–	–	95	80
4	23	63	7.1	–	8.1	–	–	–	–	–	–	64	70	–	–	–	–	84	57
4	30	63	8.2	–	8.1	–	–	–	–	–	–	65	74	–	–	–	–	105	43
5	7	63	8.2	–	8.0	–	–	–	–	–	–	63	72	–	–	–	–	74	70
5	14	63	9.7	–	8.2	–	–	–	–	–	–	63	68	–	–	–	–	89	–
5	21	63	10.9	–	8.1	–	–	–	–	–	–	59	63	–	–	–	–	82	120
5	28	63	11.7	–	8.0	–	–	–	–	–	–	56	61	–	–	–	–	67	100
6	4	63	12.0	–	8.0	–	–	–	–	–	–	56	63	–	–	–	–	70	50

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE WASHINGTON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN COLUMBIA RIVER ABOVE YAKIMA RIVER
STATION LOCATION COLUMBIA RIVER AT WENATCHEE, WASHINGTON 10

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
6	11	63	13.7	–	7.8	–	–	–	–	–	–	55	59	–	–	–	–	69	120
6	17	63	14.7	–	8.0	–	–	–	–	–	–	52	57	–	–	–	–	92	–
6	18	63	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	230
6	24	63	14.5	–	8.1	–	–	–	–	–	–	55	60	–	–	–	–	70	–
6	25	63	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	110
7	2	63	15.1	–	7.9	–	–	–	–	–	–	56	60	–	–	–	–	79	53
7	10	63	15.4	–	7.9	–	–	–	–	–	–	56	60	–	–	–	–	69	50
7	16	63	16.5	–	8.1	–	–	–	–	–	–	53	60	–	–	–	–	71	–
7	23	63	16.8	–	8.1	–	–	–	–	–	–	57	62	–	–	–	–	78	40
7	30	63	16.8	–	8.0	–	–	–	–	–	–	57	63	–	–	–	–	72	53
8	6	63	17.9	–	8.2	–	–	–	–	–	–	58	60	–	–	–	–	60	87
8	13	63	18.2	–	8.0	–	–	–	–	–	–	57	64	–	–	–	–	45	1000
8	20	63	17.5	–	8.0	–	–	–	–	–	–	57	61	–	–	–	–	60	10
8	27	63	17.2	–	8.0	–	–	–	–	–	–	52	62	–	–	–	–	80	90
9	3	63	18.0	–	8.0	–	–	–	–	–	–	56	61	–	–	–	–	92	–
9	10	63	18.7	–	7.9	–	–	–	–	–	–	55	58	–	–	–	–	87	530
9	17	63	17.5	–	7.9	–	–	–	–	–	3	56	64	5	*25	14	.0	93	100
9	24	63	17.7	–	8.1	–	–	–	–	–	–	–	–	–	–	–	–	–	730

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Trinidad, Washington
Operated by U.S. Geological Survey

STATE: Washington

MAJOR BASIN: Pacific Northwest

MINOR BASIN: Columbia River above Yakima River

STATION LOCATION: Columbia River at Wenatchee, Washington

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	62.000	63.000	88.000	80.000	74.700	85.100	86.000	128.000	231.000	242.000	128.000	74.000
2	59.000	67.000	82.000	88.700	74.400	86.000	89.000	129.000	228.000	250.000	121.000	66.000
3	59.000	70.000	88.000	84.000	64.000	85.200	91.000	130.000	228.000	245.000	120.000	70.000
4	59.000	66.000	87.800	90.000	75.900	87.000	93.000	129.000	234.000	240.000	120.000	73.000
5	61.000	67.000	84.000	80.000	76.000	81.000	92.000	131.000	239.000	242.000	118.000	76.000
6	63.000	67.000	82.000	68.000	79.700	85.300	88.000	134.000	233.000	239.000	114.000	70.000
7	63.000	66.000	78.000	82.000	81.600	87.400	87.000	136.000	229.000	229.000	111.000	68.000
8	64.000	70.000	74.000	78.000	75.000	91.400	84.000	143.000	239.000	229.000	108.000	66.000
9	63.000	67.000	77.200	80.000	85.100	86.700	89.000	149.000	247.000	234.000	108.000	70.000
10	58.000	65.000	84.200	86.000	95.000	87.000	94.000	157.000	258.000	229.000	108.000	72.000
11	60.000	62.000	80.800	93.000	96.000	92.000	96.000	134.000	268.000	229.000	109.000	74.000
12	71.000	64.000	78.000	95.000	98.000	94.900	93.000	123.000	281.000	219.000	109.000	73.000
13	68.000	65.000	77.300	96.000	96.000	87.000	87.000	117.000	289.000	218.000	113.000	70.000
14	63.000	61.000	78.000	93.000	94.000	79.200	86.000	103.000	301.000	219.000	116.000	72.000
15	63.000	58.000	77.000	95.000	94.000	72.000	89.000	104.000	304.000	209.000	118.000	72.000
16	64.000	63.000	81.000	96.000	95.000	65.000	93.000	111.000	306.000	212.000	119.000	76.000
17	69.000	67.000	85.000	98.000	87.000	62.000	97.000	113.000	308.000	218.000	117.000	83.000
18	63.000	63.000	79.500	86.000	86.000	69.900	106.000	114.000	305.000	224.000	112.000	86.000
19	62.000	62.000	83.300	84.000	89.000	69.300	109.000	116.000	302.000	223.000	110.000	92.000
20	62.000	66.000	82.100	87.000	89.000	62.900	111.000	121.000	298.000	211.000	110.000	76.000
21	61.000	72.000	84.000	92.000	91.000	62.000	114.000	132.000	295.000	202.000	110.000	66.000
22	66.000	68.000	82.000	91.000	90.600	63.000	117.000	185.000	292.000	199.000	110.000	66.000
23	67.000	75.000	82.000	81.500	90.800	63.000	115.000	210.000	289.000	183.000	110.000	68.000
24	81.000	83.000	82.000	81.500	89.000	61.000	114.000	208.000	289.000	173.000	106.000	70.000
25	82.000	82.000	79.000	81.000	90.000	68.000	110.000	202.000	288.000	152.000	99.000	70.000
26	73.000	86.000	85.000	78.000	90.000	72.000	114.000	200.000	286.000	136.000	94.000	70.000
27	74.000	89.000	81.000	73.000	85.800	71.000	118.000	200.000	283.000	131.000	87.000	70.000
28	74.000	91.000	81.000	73.000	84.800	74.000	119.000	215.000	262.000	131.000	86.000	65.000
29	76.000	92.000	87.000	77.000		79.000	119.000	224.000	249.000	133.000	83.000	65.000
30	68.000	93.000	76.000	79.300		85.000	120.000	227.000	246.000	132.000	82.000	69.000
31	65.000		75.000	75.300		85.000		230.000		132.000	79.000	

COLUMBIA RIVER AT NORTHPORT, WASHINGTON

This is the upper terminal station in the Columbia River mainstem. The station is approximately 14 miles downstream from the Canadian border. The Pend Oreille River which rises in the United States and enters Canada is confluent to the Columbia above this station.

Samples other than organic chemicals are collected from Washington State Highway Number 22 bridge at Northport. The carbon adsorption unit is located approximately 3 miles downstream on the east bank of the river.

Station Location:	Columbia River at Northport, Washington
Major Basin:	Pacific Northwest
Minor Basin:	Columbia River above Yakima River
Station at:	48°54' Latitude 117°50' Longitude
Miles above mouth:	734
Activation Date:	May 14, 1962
Sampled by:	Interested Citizens, by special arrangement
Field Analysis by:	U.S. Public Health Service
Other Cooperating Agencies:	Washington State Department of Health Washington State Pollution Control Commission
Hydrologic Data:	
Nearest pertinent gaging station:	at International Boundary
Gaging station operated by:	U.S. Geological Survey
Drainage area at gaging station:	59,700 square miles
Period of record:	1937 to date
Average discharge in record period:	98,680 cfs.

Maximum discharge in record period: 550,100 cfs.

Minimum discharge in record period: 18,000 cfs.

Remarks: Diversion for irrigation of approximately 400,000 acres above gaging station. Flow regulated by lakes and reservoirs on mainstem and tributaries.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.20	.20
	Na	2.0	2.3
	K	.7	.8
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	32	17
	Cd	*1	*2
	As	*8	*10
	B	8	7
	P	92	9
	Fe	115	4
	Mo	*1	3
	Mn	*.4	1
	Al	—	17
	Be	*.02	*.02
	Cu	4	7
	Ag	*.2	.2
	Ni	*1	*1
	Co	*2	*1
	Pb	*2	9
	Cr	*1	*2
	V	*1	*5
	Ba	46	18
	Sr	67	38

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	.9	.2	April to June	—	—
January to March	—	—	July to September	3.4	.4

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l
10/20 - 10/27/62	DDT	

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.

See page 21.

RADIOACTIVITY DETERMINATIONS

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER ABOVE YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT NORTHPORT, WASHINGTON 112

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER													RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA					BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL	SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l ±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	3	62	11	15	1	0	1	1	2 1	0	5	9	6	9	8						
10	8	62	11	2	0	1	0	1	0 1	1	6	13	7	14	9						
10	14	62	11	20	0	0	1	1	1 1	3	5	11	6	14	9						
10	22	62	12	5	0	0	2	1	2 1	4	5	13	6	17	7						
10	28	62	11	23	0	0	0	1	0 1	0	4	6	4	6	6						
11	5	62	11	30	0	1	1	1	1 1	0	9	10	6	10	11						
11	12	62	12	28	0	0	0	1	0 1	4	6	11	7	15	9						
11	19	62	12	26	-	-	-	-	- -	2	4	18	4	20	6						
11	25	62	12	18	0	1	1	1	1 1	14	6	32	7	46	9						
12	3	62	12	31	0	1	1	1	1 1	14	4	22	4	36	6						
12	10	62	1	4	0	0	1	1	1 1	9	6	16	6	25	8						
12	15	62	1	9	0	0	1	1	1 1	1	5	14	7	15	9						
12	22	62	1	16	0	1	1	1	1 1	4	7	14	7	18	10						
12	30	62	1	16	0	1	1	1	1 1	7	6	18	7	25	9						
1	20	63	2	5	0	1	1	1	1 1	11	6	13	6	24	8						
1	27	63	2	18	0	0	1	1	1 1	3	3	13	3	16	4						
2	3	63	2	25	1	0	1	1	2 1	3	3	16	4	19	5						
2	10	63	3	1	0	1	1	1	1 1	9	7	14	7	23	10						
2	19	63	3	7	0	1	1	1	1 1	8	6	14	6	22	8						
2	24	63	3	15	0	0	1	1	1 1	5	6	7	7	12	9						
3	3	63	3	27	0	1	1	1	1 1	6	6	12	7	18	9						
3	11	63	3	28	1	1	1	1	2 1	8	5	8	5	16	7						
3	16	63	4	8	0	0	1	1	1 1	5	3	7	3	12	4						
3	24	63	4	10	0	1	0	1	0 1	3	6	15	7	18	9						
3	31	63	4	22	0	0	1	1	1 1	5	3	46	4	51	5						
4	28	63	6	3*	0	0	0	0	0 0	5	3	15	4	20	5						
5	26	63	7	1*	0	0	0	1	0 1	6	3	17	4	23	5						
6	30	63	8	6*	0	0	0	0	0 0	6	6	10	7	16	9						
7	29	63	9	16*	0	1	0	1	0 1	5	3	17	3	22	4						
8	25	63	10	4*	0	1	0	1	0 1	4	5	21	7	25	9						
9	29	63	11	20*	1	1	1	1	2 1	4	4	21	6	25	7						

*

PLANKTON POPULATION

STATE WASHINGTON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN COLUMBIA RIVER ABOVE YAKIMA RIVER
STATION LOCATION COLUMBIA RIVER AT NORTHPORT, WASHINGTON

112

DATE OF SAMPLE			ALGAE (Number per milliliter)										INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS					1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	14	62	200	0	0	0	0	0	40	0	170	0	80																			
10	29	62	100	0	40	0	0	0	10	0	40	0	20																			
11	18	62	00	0	0	20	0	0	0	0	30	0	50																			
12	3	62	300	0	150	0	0	0	0	40	80	0	0																			
12	15	62	200	0	0	0	0	0	0	110	40	0	0																			
1	6	63	400	0	0	80	0	0	0	130	230	0	0																			
1	20	63	800	0	150	0	0	0	0	420	210	60	60	71	2																	
2	3	63	700	0	20	0	0	0	0	630	0	20	80	71	3																	
2	18	63	2100	0	230	20	0	0	80	1600	150	230	190	71	4	17	1															
3	3	63	700	0	0	0	0	0	40	380	250	320	340																			
3	16	63	700	0	0	0	0	0	0	40	630	130	130	92	1																	
3	31	63	400	0	0	0	0	20	40	20	310	40	290																			
4	15	63	1400	0	0	40	0	0	80	780	550	20	230	71	3																	
5	5	63	500	0	20	60	0	0	0	40	360	230	230																			
5	19	63	300	0	0	20	0	70	40	20	180	70	260																			
6	3	63	500	0	0	0	0	0	20	110	360	110	60																			
6	16	63	500	0	0	0	0	0	0	90	360	70	70																			
7	1	63	400	0	0	0	0	0	0	20	330	0	120																			
7	15	63	400	0	270	0	0	0	0	20	80	0	100																			
8	5	63	600	0	440	40	0	0	0	70	70	20	70	15	2																	
8	19	63	1400	20	70	0	0	0	0	470	800	340	2390	68	2	73	1															
9	2	63	300	20	90	0	0	0	20	130	40	0	70																			
9	15	63	800	90	20	120	0	0	0	70	470	0	70																			

PLANKTON POPULATION

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER ABOVE YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT NORTHPORT, WASHINGTON 112

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml)	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) (Number per ml)	ROTIFERS										CRUSTACEA								NEMATODES (Identifiable) (Number per liter)	OTHER ANIMAL FORMS (Number per liter)
														NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)										NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)									
															1ST		2ND		3RD		4TH		5TH			1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	14	62	95	15	92	14	56	11	47	7	53	-	-	3											0							0	0
10	29	62	95	19	92	14	56	10	47	9	48	-	-	6											0							0	0
11	18	62	95	17	92	15	2	15	47	11	42	-	-	3											0							0	0
12	3	62	92	19	2	11	82	11	9	8	51	-	-	0											0							0	0
12	15	62	95	22	92	15	9	8	47	7	48	-	-	1											0							0	0
1	6	63	82	18	95	16	92	11	47	7	48	20	0	0											0							0	0
1	20	63	82	32	95	12	2	6	46	5	45	-	-	0											0							0	0
2	3	63	82	74	95	5	1	2	46	2	17	-	-	0											0							0	0
2	18	63	82	59	9	8	95	5	2	4	24	20	-	3											1							0	0
3	3	63	61	52	9	36	92	2	89	2	8	-	-	0											0							0	0
3	16	63	82	26	9	13	95	11	45	9	41	-	-	0											0							0	0
3	31	63	95	20	9	18	71	11	47	7	44	-	-	0											0							0	0
4	15	63	82	66	9	18	95	4	47	1	11	-	-	2											0							0	0
5	5	63	95	39	82	17	47	11	9	7	26	-	-	-											-							-	-
5	19	63	82	32	95	25	2	8	56	5	30	-	-	-											-							-	-
6	3	63	82	52	95	11	9	5	46	4	28	-	-	-											-							-	-
6	16	63	27	20	9	13	35	10	95	8	49	-	-	-											-							-	-
7	1	63	35	52	82	11	9	8	30	5	24	-	-	-											-							-	-
7	15	63										-	-	-											-							-	-
8	5	63	27	49	35	7	82	7			37	-	-	-											-							-	-
8	19	63	30	25	57	17	2	9	46	5	44	-	-	-											-							-	-
9	2	63	27	27	57	19	2	13	56	6	30	-	-	-											-							-	-
9	15	63																																

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER ABOVE YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT NORTHPORT, WASHINGTON

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	20	62	10	27	4572	72	27	45	0	4	18	4	2	12	0	2	1	0	2
12	2	62	12	9	4632	77	27	50	1	9	8	0	1	7	0	3	2	1	3
4	13	63	4	21	4961	76	26	50	1	8	9	1	1	6	1	3	2	1	2
5	26	63	6	2	4577	82	31	51	2	10	8	0	1	6	1	4	2	0	5
6	28	63	7	6	4215	91	32	59	1	10	9	1	2	6	0	4	2	1	5
7	23	63	7	31	5140	86	38	48	2	12	8	0	1	6	1	4	3	0	9
8	24	63	9	1	5270	75	26	49	1	10	7	1	1	5	0	3	2	1	2
9	26	63	10	4	4962	73	23	50	1	6	7	1	1	5	0	2	2	0	5

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE WASHINGTON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN COLUMBIA RIVER ABOVE YAKIMA RIVER
STATION LOCATION COLUMBIA RIVER AT NORTHPORT, WASHINGTON 112

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	3	62	-	-	7.9	-	-	-	-	-	3	54	76	0	*25	15	.0	73	-
10	9	62	-	-	7.5	-	-	-	-	-	3	56	68	0	*25	20	.0	76	-
10	14	62	-	-	7.4	-	-	-	-	-	2	60	80	0	*25	3	.0	73	-
10	24	62	-	-	7.8	-	-	-	-	-	4	64	76	0	*25	15	.0	90	-
10	28	62	-	-	7.7	-	-	-	-	-	-	58	96	0	*25	22	.0	-	-
11	5	62	-	-	7.7	-	-	-	-	-	4	60	68	0	*25	15	.0	100	-
11	11	62	-	-	8.1	-	-	-	-	-	3	60	84	5	*25	13	.0	90	-
11	18	62	-	-	7.7	-	-	-	-	-	3	64	80	0	*25	17	.0	-	-
11	25	62	-	-	8.0	-	-	-	-	-	3	62	80	0	*25	24	.1	130	-
12	2	62	-	-	7.9	-	-	-	-	-	3	60	80	0	*25	19	.0	105	-
12	10	62	-	-	8.0	-	-	-	-	-	3	54	100	0	*25	15	.0	105	-
12	15	62	-	-	7.9	-	-	-	-	-	3	64	84	5	*25	16	.0	100	-
12	22	62	-	-	7.7	-	-	-	-	-	4	66	94	-	*25	18	.1	90	-
12	30	62	-	-	7.7	-	-	-	-	-	5	68	84	-	*25	21	.1	100	-
1	13	63	-	-	8.0	-	-	-	-	-	3	68	84	-	*25	19	.1	110	-
1	20	63	-	-	7.9	-	-	-	-	-	5	68	80	-	*25	17	.0	125	-
1	27	63	-	-	7.9	-	-	-	-	-	5	68	88	-	*25	16	.1	97	-
2	3	63	-	-	7.7	-	-	-	-	-	2	56	100	5	*25	19	.0	125	-
2	10	63	-	-	7.8	-	-	-	-	-	2	72	88	5	*25	15	.0	100	-
2	17	63	-	-	7.8	-	-	-	-	-	9	80	96	0	*25	13	.0	110	-
2	24	63	-	-	7.8	-	-	-	-	-	3	100	124	0	*25	20	.0	160	-
3	3	63	-	-	7.8	-	-	-	-	-	2	74	92	0	*25	15	.0	99	-
3	11	63	-	-	7.7	-	-	-	-	-	4	68	84	0	*25	16	.1	99	-
3	16	63	-	-	7.0	-	-	-	-	-	5	68	88	0	*25	15	.0	116	-
3	24	63	-	-	7.1	-	-	-	-	-	4	76	88	0	*25	18	.0	124	-
3	31	63	-	-	7.3	-	-	-	-	-	4	64	84	0	*25	16	.0	91	-
4	7	63	-	-	7.9	-	-	-	-	-	4	72	104	0	*25	20	.0	103	-
4	15	63	-	-	7.5	-	-	-	-	-	3	72	88	0	*25	18	.1	88	-
4	21	63	-	-	7.3	-	-	-	-	-	2	2	80	5	*25	13	.0	99	-
4	28	63	-	-	-	-	-	-	-	-	3	80	92	0	*25	20	.0	102	-
5	5	63	-	-	-	-	-	-	-	-	5	72	76	0	*25	14	.0	88	-
5	12	63	-	-	-	-	-	-	-	-	4	88	76	0	*25	13	.0	120	-
5	19	63	-	-	-	-	-	-	-	-	3	64	72	5	*25	14	.0	97	-
5	26	63	-	-	-	-	-	-	-	-	4	68	96	0	*25	14	.0	82	-
6	3	63	-	-	-	-	-	-	-	-	3	56	72	0	*25	14	.0	68	-
6	9	63	-	-	-	-	-	-	-	-	5	58	72	0	*25	11	.0	83	-
6	16	63	-	-	-	-	-	-	-	-	5	56	80	5	*25	11	.0	98	-
6	24	63	-	-	-	-	-	-	-	-	3	56	80	5	*25	13	.0	104	-
6	30	63	-	-	-	-	-	-	-	-	2	56	76	0	*25	11	.0	77	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN COLUMBIA RIVER ABOVE YAKIMA RIVER

STATION LOCATION COLUMBIA RIVER AT NORTHPORT, WASHINGTON 112

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	7	63	–	–	–	–	–	–	–	–	4	58	72	0	*25	11	.0	104	–
7	15	63	–	–	–	–	–	–	–	–	3	58	72	0	*25	13	.0	72	–
7	21	63	–	–	–	–	–	–	–	–	4	52	76	0	*25	11	.0	69	–
7	29	63	–	–	–	–	–	–	–	–	4	54	76	0	*25	13	.0	62	–
8	5	63	–	–	–	–	–	–	–	–	5	56	62	0	*25	13	.0	67	–
8	12	63	–	–	–	–	–	–	–	–	4	54	66	0	*25	14	.0	75	–
8	19	63	–	–	–	–	–	–	–	–	4	52	66	0	*25	13	.0	76	–
8	25	63	–	–	–	–	–	–	–	–	2	54	66	5	*25	15	.0	81	–
9	2	63	–	–	–	–	–	–	–	–	6	56	68	0	*25	16	.0	82	–
9	8	63	–	–	–	–	–	–	–	–	2	54	64	0	*25	14	.0	75	–
9	15	63	–	–	–	–	–	–	–	–	2	54	68	0	*25	15	.0	76	–
9	22	63	–	–	–	–	–	–	–	–	2	56	60	0	*25	12	.0	77	–
9	29	63	–	–	–	–	–	–	–	–	7	54	66	0	*25	18	.1	88	–

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at international boundary, Washington
Operated by U.S. Geological Survey

STATE: Washington

MAJOR BASIN: Pacific Northwest

MINOR BASIN: Columbia River above Yakima River

STATION LOCATION: Columbia River at Northport, Washington

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	51.000	61.000	67.000	52.000	41.000	63.000	66.000	91.000	227.000	223.000	138.000	78.000
2	48.000	58.000	71.000	51.000	40.000	57.000	69.000	94.000	235.000	225.000	132.000	73.000
3	49.000	55.000	62.000	52.000	39.000	56.000	66.000	95.000	239.000	228.000	129.000	73.000
4	49.000	53.000	57.000	53.000	35.000	59.000	63.000	100.000	243.000	229.000	124.000	65.000
5	55.000	52.000	51.000	57.000	35.000	54.000	66.000	107.000	246.000	227.000	120.000	69.000
6	54.000	54.000	54.000	51.000	43.000	51.000	62.000	112.000	247.000	222.000	117.000	56.000
7	56.000	55.000	56.000	53.000	57.000	53.000	63.000	116.000	248.000	220.000	115.000	69.000
8	51.000	53.000	55.000	54.000	65.000	58.000	63.000	120.000	254.000	221.000	114.000	64.000
9	51.000	53.000	55.000	57.000	73.000	51.000	64.000	126.000	262.000	223.000	114.000	66.000
10	55.000	54.000	52.000	57.000	72.000	46.000	65.000	126.000	266.000	221.000	111.000	70.000
11	59.000	51.000	48.000	56.000	68.000	45.000	66.000	124.000	269.000	214.000	109.000	70.000
12	58.000	52.000	53.000	47.000	72.000	45.000	67.000	122.000	272.000	214.000	109.000	70.000
13	56.000	52.000	53.000	39.000	75.000	46.000	66.000	121.000	274.000	215.000	114.000	75.000
14	58.000	54.000	54.000	42.000	72.000	49.000	67.000	119.000	278.000	210.000	118.000	69.000
15	58.000	57.000	52.000	43.000	62.000	46.000	70.000	116.000	280.000	207.000	119.000	70.000
16	58.000	54.000	57.000	38.000	58.000	45.000	74.000	112.000	283.000	206.000	120.000	71.000
17	56.000	53.000	58.000	33.000	55.000	46.000	73.000	110.000	282.000	203.000	118.000	76.000
18	53.000	54.000	58.000	36.000	56.000	46.000	78.000	111.000	285.000	198.000	119.000	77.000
19	53.000	51.000	59.000	40.000	57.000	47.000	81.000	114.000	283.000	192.000	117.000	71.000
20	53.000	53.000	61.000	41.000	58.000	50.000	82.000	120.000	286.000	186.000	114.000	66.000
21	54.000	57.000	60.000	41.000	58.000	54.000	84.000	125.000	288.000	182.000	115.000	64.000
22	58.000	65.000	61.000	39.000	58.000	55.000	86.000	131.000	288.000	181.000	114.000	62.000
23	70.000	60.000	57.000	42.000	57.000	56.000	84.000	140.000	285.000	177.000	109.000	61.000
24	65.000	57.000	52.000	41.000	57.000	56.000	84.000	150.000	275.000	175.000	104.000	61.000
25	61.000	55.000	51.000	43.000	57.000	56.000	85.000	161.000	270.000	169.000	99.900	60.000
26	64.000	62.000	49.000	44.000	57.000	61.000	85.000	172.000	266.000	163.000	95.700	60.000
27	62.000	71.000	48.000	42.000	56.000	60.000	83.000	185.000	259.000	158.000	95.000	57.000
28	57.000	77.000	45.000	40.000	59.000	62.000	82.000	194.000	244.000	152.000	94.000	57.000
29	54.000	65.000	49.000	44.000		69.000	84.000	205.000	235.000	148.000	96.000	57.000
30	59.000	63.000	51.000	44.000		63.000	88.000	210.000	229.000	146.000	85.000	57.000
31	63.000		55.000	44.000		63.000		218.000		141.000	82.000	

PEND OREILLE RIVER AT ALBENI FALLS DAM, IDAHO

This Water Pollution Surveillance System station is located in the Albeni Falls Dam powerhouse. Albeni Falls Dam, located near the Washington-Idaho border, creates an impoundment which extends upstream to Pend Oreille Lake, a large natural lake. The principal stream feeding Lake Pend Oreille is the Clark Fork River which drains a large portion of western Montana.

The principal community on Pend Oreille Lake is Sandpoint, Idaho which discharges an estimated 1300 BOD population equivalents of treated wastes into the Lake near its outlet to the Pend Oreille River. Priest River, Idaho discharges approximately 480 BOD population equivalents of treated municipal waste to Pend Oreille River above the Surveillance System station. No major municipal waste loads are discharged to the Pend Oreille River below the station.

Station Location:	Pend Oreille River at Albeni Falls Dam, Idaho
Major Basin:	Pacific Northwest
Minor Basin:	Clark Fork-Pend Oreille River
Station at:	48°10' Latitude 117°00' Longitude
Miles above mouth:	90
Activation Date:	May 14, 1962
Sampled by:	U.S. Army Corps of Engineers
Field Analysis by:	U.S. Public Health Service
Other Cooperating Agencies:	Washington State Department of Health Idaho State Board of Health
Hydrologic Data:	
Nearest pertinent gaging station:	At Newport Washington
Gaging station operated by:	U.S. Geological Survey
Drainage area at gaging station:	24,200 square miles
Period of record:	1903-1941, 1952 to present
Average discharge in record period:	25,410 cfs.

Maximum discharge in record period: 136,000 cfs.

Minimum discharge in record period: 1,280 cfs.

Remarks: Flow regulated by Albeni Falls Dam and influenced by upstream lakes and reservoirs. Diversions are made in the upper portion of the basin above the station for irrigation of approximately 340,000 acres.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.21	.10
	Na	3.0	2.7
	K	1.1	.7
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	39	3
	Cd	2	*2
	As	*10	*10
	B	10	4
	P	59	*4
	Fe	74	2
	Mo	14	13
	Mn	.4	1.5
	Al	—	4
	Be	*.02	*.02
	Cu	11	4
	Ag	*.2	*.2
	Ni	*1	2
	Co	*2	1
	Pb	12	*2
	Cr	*1	2
	V	*1	*4
	Ba	27	2
	Sr	31	15

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	.7	.2	April to June	.9	.2
January to March	—	—	July to September	—	—

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l
8/13 - 8/20/63	DDT	0.001

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN CLARK FORK-PEND OREILLE RIVER

STATION LOCATION PEND OREILLE RIVER AT ALBENI FALLS DAM, IDAHO 113

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON				
			DATE OF DETERMINATION	ALPHA					BETA						DATE OF DETERMINATION	GROSS ACTIVITY			
				SUSPENDED		DISSOLVED		TOTAL	SUSPENDED		DISSOLVED		TOTAL			ALPHA		BETA	
MO.	DAY	YR.	MO. DAY	pc/l	±	pc/l	±	pc/l ±	pc/l	±	pc/l	±	pc/l	±	MO. DAY	pc/g	±	pc/g	±
10	5	62	10 30	0	0	0	1	0 1	0	7	10	5	10	9					
10	15	62	11 7	0	0	1	1	1 1	6	6	10	7	16	9					
10	19	62	11 15	–	–	–	–	– –	9	6	11	6	20	8					
10	26	62	11 21	0	1	1	1	1 1	3	6	12	7	15	9					
11	2	62	11 23	0	0	0	1	0 1	9	5	22	6	31	7					
11	9	62	12 4	0	1	0	0	0 1	12	6	18	7	30	9					
11	16	62	12 6	0	1	1	1	1 1	7	6	28	7	35	9					
11	23	62	12 13	0	0	0	0	0 0	19	7	63	8	82	10					
12	14	62	1 9	0	0	0	1	0 1	1	6	16	7	17	9					
12	21	62	1 9	0	1	1	1	1 1	9	6	18	7	27	9					
12	28	62	1 14	0	0	0	1	0 1	5	3	10	3	15	4					
1	4	63	1 18	1	1	0	1	1 1	24	6	36	7	60	9					
1	11	63	1 25	0	1	0	1	0 1	10	6	16	7	26	9					
1	18	63	2 1	1	1	1	1	2 1	8	6	15	6	23	8					
1	25	63	2 11	0	1	0	1	0 1	4	3	11	3	15	4					
2	1	63	2 18	0	0	1	1	1 1	6	3	13	3	19	4					
2	8	63	2 25	0	1	0	1	0 1	18	4	23	4	41	6					
2	15	63	3 7	0	1	0	1	0 1	6	6	15	7	21	9					
2	21	63	3 11	0	1	0	1	0 1	10	5	10	6	20	8					
3	1	63	3 25	0	0	1	1	1 1	3	3	9	3	12	4					
3	8	63	3 25	0	1	0	1	0 1	53	4	12	4	65	6					
3	15	63	4 5	0	1	1	1	1 1	2	5	7	5	9	7					
3	22	63	4 8	0	0	0	0	0 0	10	3	11	3	21	4					
3	29	63	4 16	0	1	0	1	0 1	15	6	20	7	35	9					
4	26	63	5 31*	0	1	0	1	0 1	5	3	11	4	16	5					
5	31	63	6 25*	0	1	0	1	0 1	8	6	7	6	15	8					
6	28	63	8 6*	0	0	0	1	0 1	1	5	9	7	10	9					
7	26	63	9 20*	1	1	1	1	2 1	4	5	13	5	17	7					
8	20	63	10 14*	0	0	0	1	0 1	4	3	13	4	17	5					
9	27	63	11 20*	0	0	0	1	0 1	1	4	11	6	12	7					

PLANKTON POPULATION

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN CLARK FORK-PEND OREILLE RIVER

STATION LOCATION PEND OREILLE RIVER AT ALBENI FALLS DAM, IDAHO

113

DATE OF SAMPLE			ALGAE (Number per milliliter)										INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS					1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	10	62	00	0	0	0	0	0	0	0	20	0	60																			
11	2	62	400	0	0	0	0	0	40	80	290	0	0																			
11	13	62	00	0	0	0	0	0	0	20	30	50	120																			
11	26	62	100	0	0	0	0	0	0	50	80	0	240																			
12	7	62	100	0	20	20	0	0	0	20	70	90	20																			
1	3	63	100	0	0	0	0	0	0	50	30	30	80																			
1	15	63	200	0	0	20	0	0	0	120	90	80	170																			
1	30	63	700	0	110	0	0	0	0	440	110	40	110	71	2																	
2	18	63	2200	0	40	130	0	0	80	1850	130	40	40	71	4	68	2															
2	27	63	700	0	0	0	0	0	20	330	310	0	70	71	2																	
3	15	63	500	0	0	0	0	40	20	20	400	20	240																			
3	26	63	700	0	40	0	0	20	210	20	380	40	170	65	1																	
4	10	63	500	0	40	0	0	0	20	40	400	60	190	77	1																	
5	6	63	300	0	0	20	0	0	0	20	290	130	350	93	1																	
5	14	63	800	0	0	0	0	20	150	130	480	0	400																			
5	31	63	600	0	20	20	0	0	40	130	420	80	150	93	1																	
6	13	63	400	0	0	0	0	130	0	40	180	90	130																			
6	24	63	300	0	0	20	0	0	0	50	270	0	70																			
7	31	63	100	0	0	0	0	0	0	20	40	0	20																			
8	16	63	100	80	20	0	0	0	0	0	20	0	0																			
9	13	63	00	0	0	0	0	0	0	20	0	0	0																			

PLANKTON POPULATION

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN CLARK FORK-PEND OREILLE RIVER

STATION LOCATION PEND OREILLE RIVER AT ALBENI FALLS DAM, IDAHO

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml)	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH		OTHER SPECIES PERCENT		PROTOZOA (Genus/make) Number per ml	ROTIFERS										CRUSTACEA							NEMATODES (Genus/make) Number per liter	OTHER ANIMAL FORMS (Number per liter)
														NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes) 1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes) 1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT					GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	10	62	58	25	46	13	56	8	95	7	47	-	-	55	17	4	5	1																
11	2	62	61	18	92	9	57	8	9	6	59	-	-	2											33	50	2	51	2	76	2	[illegible]	0
11	13	62	92	14	95	10	46	9	9	5	62	-	-	3											0							0	0
11	26	62	92	22	61	11	95	6	47	5	56	20	-	0											9	76	2					0	0
12	7	62	92	14	47	8	46	7	56	5	66	150	-	0											1							0	0
1	3	63	95	28	47	12	61	9	9	7	44	-	-	0											0							0	0
1	15	63	82	24	9	13	56	6	92	6	51	-	-	0											0							0	0
1	30	63	82	38	95	10	9	9	64	5	38	-	-	1											0							0	0
2	18	63	95	58	9	7	47	5	46	4	26	-	-	1											0							0	0
2	27	63	82	39	9	22	95	11	1	4	24	-	-	1											0							0	0
3	15	63	82	31	9	19	95	10	92	7	33	-	-	0											9	76	2					0	0
3	26	63	95	45	47	15	9	10	82	9	21	-	-	0											0							0	0
4	10	63	9	35	95	17	82	5	47	5	38	-	-	0											0							0	0
5	6	63	95	34	47	14	82	12	9	9	31	-	-	-											0							0	0
5	14	63	64	20	32	14	92	7	70	5	54	-	-	-											-							-	-
5	31	63	95	78	77	4	47	4	56	3	11	-	-	-											-							-	-
6	13	63	95	53	47	17	9	5	77	3	22	-	-	-											-							-	-
6	24	63	9	42	95	25	82	3	77	3	27	-	-	-											-							-	-
7	31	63										-	-	-											-							-	-
8	16	63										-	-	-											-							-	-
9	17	63										-	-	-											-							-	-

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN CLARK FORK-PEND OREILLE RIVER

STATION LOCATION PEND OREILLE RIVER AT ALBENI FALLS DAM, IDAHO

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	CHLOROFORM EXTRACTABLES NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	2	62	10	10	5000	101	27	74	1	9	9	1	0	8	0	2	1	1	4
11	6	62	11	15	5000	104	25	79	0	8	8	1	0	7	0	2	1	1	5
12	11	62	12	19	5000	99	23	76	2	7	7	0	0	7	0	2	1	1	4
1	15	63	1	23	5000	77	12	65	0	3	5	0	0	5	0	1	0	0	3
2	19	63	2	27	5000	59	14	45	0	4	5	1	1	3	0	2	1	0	2
3	26	63	4	3	5000	48	16	32	0	5	7	2	1	4	0	1	1	0	2
4	30	63	5	7	1194#	315	73	242	1	21	29	4	4	19	2	7	2	2	11
6	4	63	6	12	5000	86	28	58	1	9	7	1	0	6	0	3	2	1	5
7	9	63	7	17	5000#	89	33	56	1	12	7	0	1	6	0	3	2	0	7
8	13	63	8	20	5000#	78	28	50	0	9	8	0	1	7	0	3	2	0	6
9	17	63	9	24	4837	94	25	69	1	8	6	1	0	5	0	2	2	1	5

ESTIMATED

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE IDAHO
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN CLARK FORK-PEND OREILLE RIVER
STATION LOCATION PEND OREILLE RIVER AT ALBENI FALLS DAM, IDAHO

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	5	62	-	-	8.1	-	-	-	-	-	3	72	80	0	*25	9	.0	76	-
10	15	62	-	-	7.8	-	-	-	-	-	3	72	76	0	*25	9	.0	104	-
10	19	62	-	-	-	-	-	-	-	-	3	76	76	0	*25	8	.0	105	-
10	26	62	-	-	-	-	-	-	-	-	3	72	80	0	*25	8	.0	90	-
11	2	62	-	-	8.0	-	-	-	-	-	4	56	70	0	*25	6	.0	80	-
11	9	62	-	-	7.9	-	-	-	-	-	3	64	68	5	*25	5	.0	70	-
11	16	62	-	-	7.9	-	-	-	-	-	-	64	72	0	*25	9	.0	110	-
11	23	62	-	-	8.3	-	-	-	-	-	4	68	84	0	*25	7	.0	85	-
12	14	62	-	-	8.1	-	-	-	-	-	3	66	72	0	*25	10	.0	95	-
12	21	62	-	-	8.1	-	-	-	-	-	6	66	76	0	*25	10	.0	100	-
12	28	62	-	-	7.8	-	-	-	-	-	4	68	76	0	*25	9	.0	110	-
1	4	63	-	-	7.9	-	-	-	-	-	3	60	68	-	*25	8	.0	115	-
1	11	63	-	-	8.2	-	-	-	-	-	2	68	72	-	*25	10	.0	78	-
1	18	63	-	-	8.0	-	-	-	-	-	3	64	68	-	*25	12	.0	90	-
1	25	63	-	-	8.0	-	-	-	-	-	3	64	92	-	*25	9	.0	115	-
2	1	63	-	-	8.0	-	-	-	-	-	3	68	80	-	*25	10	.0	89	-
2	8	63	-	-	8.0	-	-	-	-	-	3	70	92	5	*25	9	.0	100	-
2	15	63	-	-	7.8	-	-	-	-	-	3	72	80	0	*25	9	.0	85	-
2	21	63	-	-	7.9	-	-	-	-	-	2	72	76	0	*25	8	.0	80	-
3	1	63	-	-	7.7	-	-	-	-	-	2	72	78	0	*25	7	.0	95	-
3	8	63	-	-	7.9	-	-	-	-	-	3	68	84	5	*25	7	.0	89	-
3	15	63	-	-	7.6	-	-	-	-	-	4	66	84	0	*25	7	.0	60	-
3	22	63	-	-	7.2	-	-	-	-	-	2	80	84	0	*25	7	.0	110	-
3	29	63	-	-	7.3	-	-	-	-	-	4	68	76	5	*25	10	.0	108	-
4	5	63	-	-	7.9	-	-	-	-	-	7	72	84	0	*25	9	.0	84	-
4	12	63	-	-	8.0	-	-	-	-	-	3	64	76	0	*25	8	.0	75	-
4	19	63	-	-	7.3	-	-	-	-	-	2	68	76	0	*25	7	.0	87	-
4	26	63	-	-	7.4	-	-	-	-	-	2	64	80	5	*25	8	.0	88	-
5	3	63	-	-	-	-	-	-	-	-	3	68	68	5	*25	7	.0	81	-
5	10	63	-	-	-	-	-	-	-	-	7	60	64	0	*25	7	.0	72	-
5	17	63	-	-	-	-	-	-	-	-	4	32	60	5	*25	6	.0	68	-
5	24	63	-	-	-	-	-	-	-	-	5	48	56	0	*25	6	.0	82	-
5	31	63	-	-	-	-	-	-	-	-	2	48	56	0	*25	7	.0	-	-
6	7	63	-	-	-	-	-	-	-	-	5	54	60	0	*25	6	.0	76	-
6	14	63	-	-	-	-	-	-	-	-	4	50	60	0	*25	6	.0	72	-
6	21	63	-	-	-	-	-	-	-	-	5	62	72	0	*25	7	.0	94	-
6	28	63	-	-	-	-	-	-	-	-	3	56	64	5	*25	8	.0	100	-
7	8	63	-	-	-	-	-	-	-	-	4	66	76	5	*25	8	.0	110	-
7	12	63	-	-	-	-	-	-	-	-	3	60	68	0	*25	7	.0	98	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE. IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN CLARK FORK-PEND OREILLE RIVER

STATION LOCATION PEND OREILLE RIVER AT ALDENI FALLS DAM, IDAHO 113

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	19	63	-	-	-	-	-	-	-	-	3	68	72	5	*25	9	.0	77	-
7	26	63	-	-	-	-	-	-	-	-	3	68	76	0	*25	8	.0	82	-
8	2	63	-	-	-	-	-	-	-	-	4	70	78	0	*25	9	.0	72	-
8	9	63	-	-	-	-	-	-	-	-	4	70	74	0	*25	9	.0	92	-
8	16	63	-	-	-	-	-	-	-	-	4	74	72	0	*25	8	.0	90	-
8	23	63	-	-	-	-	-	-	-	-	6	72	80	0	*25	11	.0	96	-
8	30	63	-	-	-	-	-	-	-	-	5	70	80	5	*25	11	.0	84	-
9	6	63	-	-	-	-	-	-	-	-	2	70	78	0	*25	8	.0	89	-
9	13	63	-	-	-	-	-	-	-	-	2	72	76	0	*25	11	.0	79	-
9	20	63	-	-	-	-	-	-	-	-	3	80	76	0	*25	10	.0	94	-
9	27	63	-	-	-	-	-	-	-	-	2	76	72	5	*25	9	.0	96	-

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Newport, Washington
Data Supplied by U.S. Geological Survey

STATE: Idaho

MAJOR BASIN: Pacific Northwest

MINOR BASIN: Clark Fork-Pend Oreille River

STATION LOCATION: Pend Oreille River at Albeni Falls Dam, Idaho

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	10.000	15.500	27.900	23.600	18.100	25.900	27.100	34.300	36.000	43.000	12.000	4.100
2	8.100	14.500	28.100	23.500	18.100	23.500	28.200	38.400	36.000	56.300	11.000	5.200
3	10.100	14.000	24.000	23.400	18.000	23.500	29.500	40.100	38.700	56.500	9.900	6.300
4	11.000	14.000	20.000	23.500	21.500	23.400	30.000	41.300	41.100	51.700	10.000	4.100
5	11.000	14.800	19.000	23.400	25.100	21.800	27.800	42.700	36.600	45.200	10.000	5.000
6	11.000	15.500	19.600	23.500	28.300	21.900	26.000	42.100	34.000	41.000	10.000	7.400
7	11.000	15.500	20.000	23.600	31.400	22.200	26.000	41.200	40.400	39.800	10.000	7.400
8	13.000	15.000	20.000	22.000	33.100	18.400	27.300	40.000	50.800	39.000	10.000	4.000
9	15.500	13.700	20.100	21.500	33.000	17.100	28.300	40.100	51.000	35.800	9.500	7.400
10	17.000	13.000	20.000	20.000	33.200	17.000	28.200	40.000	52.600	26.500	6.000	7.500
11	16.100	13.500	20.000	18.100	33.100	17.000	28.200	40.100	55.000	25.800	6.000	7.400
12	17.000	14.000	20.000	15.100	33.700	18.500	28.300	40.000	55.000	28.700	10.500	8.800
13	18.100	16.600	21.400	15.000	33.000	20.000	28.300	37.600	54.500	27.000	14.000	8.900
14	18.100	18.500	21.500	16.300	31.500	20.000	28.200	34.900	54.000	26.100	14.600	8.900
15	19.000	17.900	21.500	15.000	28.600	20.000	28.600	33.000	54.000	26.000	12.800	8.700
16	19.300	18.300	21.500	18.000	27.000	20.000	30.200	29.500	54.000	23.800	9.100	11.400
17	18.000	21.000	23.100	20.500	26.900	20.000	33.600	29.100	51.000	23.100	8.800	12.200
18	18.000	21.100	26.300	22.000	27.000	22.000	36.000	31.200	47.600	21.900	7.100	7.500
19	18.000	21.100	27.700	21.000	27.100	24.500	36.100	32.000	45.500	18.000	8.500	7.500
20	18.000	19.900	28.000	19.000	27.000	25.900	36.500	32.200	42.100	15.900	8.600	6.000
21	18.000	20.000	24.800	19.500	27.000	26.000	37.000	29.900	37.300	16.000	11.700	7.100
22	18.100	21.000	21.900	20.000	27.100	26.900	37.000	31.300	35.100	18.000	12.100	7.100
23	18.000	21.600	21.900	20.000	27.100	26.100	37.100	32.000	35.000	18.000	8.600	8.800
24	17.500	22.100	21.900	20.000	27.000	25.200	37.000	32.000	40.200	16.000	5.500	7.200
25	17.000	22.400	21.900	20.000	27.100	28.000	37.000	32.000	45.300	15.100	5.500	7.100
26	17.100	25.100	21.200	20.000	25.200	26.000	34.700	32.100	41.100	14.000	5.300	8.800
27	17.100	25.900	20.500	18.100	25.200	26.000	33.000	32.100	35.400	13.100	7.600	6.800
28	17.100	26.000	20.500	18.000	27.200	26.000	33.000	31.900	33.500	12.900	7.500	6.100
29	18.000	27.300	20.400	20.100		26.100	33.000	32.000	33.500	14.100	11.500	6.100
30	19.100	28.000	20.400	20.000		26.100	33.000	32.000	33.500	13.000	14.000	7.200
31	17.000		22.100	19.100		26.200		33.900		13.000	4.500	

SNAKE RIVER AT ICE HARBOR DAM, WASHINGTON

This Water Pollution Surveillance System station is located in the Ice Harbor Dam powerhouse and monitors the discharge of the Snake River to the Columbia River.

There are no municipal water users within 100 miles upstream of this station. The flow is regulated and provides for an extensive irrigated agriculture.

Station Location: Snake River at Ice Harbor Dam, Washington

Major Basin: Pacific Northwest

Minor Basin: Middle and Lower Snake River

Station at: 46°15' Latitude 118°53' Longitude

Miles above mouth: 10

Activation Date: May 21, 1962

Sampled by: U.S. Army Corps of Engineers

Field Analysis by: U.S. Public Health Service

Other Cooperating Agencies: Washington State Department of Health
Washington State Pollution Control Commission

Hydrologic Data:

Nearest pertinent gaging station: Near Clarkston, Washington

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 103,200 square miles

Period of record: 1915 to present

Average discharge in record period: 45,140 cfs. W.Y. 1962

Maximum discharge in record period: 369,000 cfs.

Minimum discharge in record period: 6,660 cfs.

Remarks: Irrigation diversion for approximately 2.8 million acres above gaging station. Flow regulated by storage reservoirs and affected by powerplants.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.46	.25
	Na	26	9.9
	K	3.7	1.7
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	15	6
	Cd	*2	*2
	As	*19	*10
	B	51	17
	P	*5	11
	Fe	45	4
	Mo	*2	8
	Mn	*1	*1.5
	Al	—	8
	Be	*.05	*.04
	Cu	15	11
	Ag	*.4	*.4
	Ni	*2	2
	Co	*4	3
	Pb	*5	*4
	Cr	*1	*4
	V	*2	19
	Ba	33	15
	Sr	146	28

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	.6	.2	April to June	—	—
January to March	—	—	July to September	1.3	.4

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE WASHINGTON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN MIDDLE AND LOWER SNAKE RIVER
STATION LOCATION SNAKE RIVER AT
ICE HARBOR DAM, WASHINGTON 115

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON				
			DATE OF DETERMINATION	ALPHA					BETA						DATE OF DETERMINATION	GROSS ACTIVITY			
				SUSPENDED		DISSOLVED		TOTAL	SUSPENDED		DISSOLVED		TOTAL			ALPHA		BETA	
MO.	DAY	YR.	MO. DAY	pc/l	±	pc/l	±	pc/l ±	pc/l	±	pc/l	±	pc/l	±	MO. DAY	pc/g	±	pc/g	±
10	6	62	12 13	0	1	2	1	2 1	5	6	17	9	22	11					
10	16	62	11 20	–	–	–	–	– –	11	6	25	8	36	10					
10	23	62	11 21	0	0	1	1	1 1	5	6	22	7	27	9					
10	29	62	12 20	0	0	2	1	2 1	3	5	15	7	18	9					
11	5	62	12 4	0	1	4	2	4 2	5	6	21	8	26	10					
11	13	62	12 4	0	0	2	1	2 1	2	5	17	8	19	9					
11	19	62	12 3	0	0	2	1	2 1	11	6	30	9	41	11					
11	26	62	12 28	1	1	2	1	3 1	11	6	25	7	36	9					
12	3	62	1 2	0	1	1	1	1 1	9	4	15	5	24	6					
12	10	62	1 4	0	0	2	1	2 1	5	6	16	8	21	10					
12	17	62	1 14	0	0	1	1	1 1	9	3	16	4	25	5					
12	24	62	1 10	0	1	1	1	1 1	7	6	17	8	24	10					
12	31	62	1 16	0	1	1	1	1 1	5	6	18	6	23	10					
1	7	63	1 24	0	0	1	1	1 1	6	6	15	8	21	10					
1	21	63	2 6	0	0	5	2	5 2	6	6	18	9	24	11					
1	28	63	2 18	0	1	2	2	2 2	27	3	18	4	45	5					
2	4	63	2 25	0	1	3	2	3 2	10	4	23	5	33	6					
2	25	63	3 18	1	1	1	1	2 1	21	4	29	4	50	6					
3	4	63	3 27	0	0	1	1	1 1	18	6	19	7	37	9					
3	11	63	4 1	0	0	1	1	1 1	11	3	19	3	30	4					
3	18	63	4 8	0	0	0	1	0 1	4	3	22	4	26	5					
3	25	63	4 10	0	1	1	1	1 1	9	6	25	7	34	9					
4	29	63	6 3*	0	0	0	1	0 1	9	3	25	4	34	5					
5	27	63	6 25*	0	1	1	1	1 1	6	6	18	7	24	9					
6	24	63	8 6*	0	0	0	1	0 1	5	6	15	7	20	9					
7	29	63	8 23*	0	1	1	1	1 1	4	6	17	7	21	9					
8	26	63	10 10*	0	0	1	1	1 1	0	12	18	7	18	14					
9	30	63	11 20*	0	1	0	1	0 1	3	4	19	6	22	7					

736-491 O—64——8

PLANKTON POPULATION

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE AND LOWER SNAKE RIVER

STATION LOCATION SNAKE RIVER AT

ICE HARBOR DAM, WASHINGTON 115

DATE OF SAMPLE			ALGAE (Number per milliliter)								INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATES (Pigmented)		DIATOMS			1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	1400	20	200	430	0	20	0	230	500	320	630	92	2	12	1	25	1	69	1												
10	16	62	400	0	0	40	0	0	0	100	210	80	190																				
10	31	62	200	0	0	90	0	0	0	20	140	70	270																				
11	19	62	1300	0	0	0	0	0	0	410	880	720	1220	69	1	87	1																
12	3	62	100	0	0	0	0	0	0	0	110	20	360																				
12	17	62	200	0	0	0	0	0	0	90	70	0	200																				
1	7	63	500	0	0	0	0	0	0	130	400	80	80																				
1	21	63	300	0	20	0	0	20	0	50	170	130	130																				
2	4	63	600	0	0	0	0	20	0	350	220	70	40	71	2																		
2	25	63	400	0	0	0	0	20	110	90	130	150	200																				
3	4	63	200	0	0	0	0	0	40	70	130	110	70																				
3	18	63	200	0	40	10	0	40	0	10	70	70	100																				
4	1	63	500	0	0	40	0	20	40	70	330	70	330																				
4	15	63	300	0	0	0	0	0	40	60	230	20	380																				
5	6	63	400	0	20	0	0	0	0	70	310	20	510																				
5	20	63	1500	0	0	40	0	0	0	1170	240	130	330	71	3																		
6	3	63	1000	0	20	80	0	0	20	360	500	60	290	71	2	77	1	82	1														
6	17	63	600	0	0	0	0	0	0	400	200	110	240	71	1																		
7	1	63	200	0	0	70	0	0	0	50	70	70	160																				
7	15	63	1200	0	0	60	0	40	0	1010	120	370	100	71	3	68	1																
8	5	63	400	0	40	40	0	0	0	250	80	270	80																				
8	19	63	1100	40	390	220	0	0	0	300	130	750	150	15	2	71	1																
9	2	63	300	0	0	70	0	20	0	190	20	340	90																				
9	16	63	400	0	0	20	0	20	0	160	200	90	200																				

PLANKTON POPULATION

STATE WASHINGTON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN MIDDLE AND LOWER SNAKE RIVER
STATION LOCATION SNAKE RIVER AT
ICE HARBOR DAM, WASHINGTON 115

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) Number per ml.	ROTIFERS										CRUSTACEA									NEMATODES (Identifiable) Number per liter	OTHER ANIMAL FORMS (Number per liter)
														NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)										NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)									
															1ST		2ND		3RD		4TH		5TH				1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL			GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	1	62	92	37	47	32	58	20	36	3	8	-	-	50	17	3	11	2	15	1	16	1			85	51	5	50	3	53	3	0	0
10	16	62	58	22	36	12	92	10	47	9	47	-	-	0											0							0	0
10	31	62	58	16	92	14	36	6	80	6	58	-	-	2											0							0	0
11	19	62	56	21	97	18	92	7	36	6	48	-	-	0											0							0	0
12	3	62	56	13	2	9	82	7	41	7	64	20	0	0											0							0	0
12	17	62	56	29	82	7	52	6	80	5	53	-	-	0											0							0	0
1	7	63	56	39	9	12	80	8	92	7	34	-	-	0											0							0	0
1	21	63	82	27	9	12	80	9	2	8	44	80	0	0											0							0	0
2	4	63	82	43	9	18	80	14	71	4	21	-	-	2											0							0	0
2	25	63	55	19	26	17	82	10	92	7	47	-	-	0											0							0	0
3	4	63	82	24	9	23	71	8	56	5	40	-	-	0											0							0	0
3	18	63	82	46	9	8	51	8	65	3	35	-	-	0											0							0	0
4	1	63	9	21	51	9	58	8	80	7	55	-	-	2											0							0	0
4	15	63	56	17	92	11	31	8	65	4	60	-	-	2											0							0	0
5	6	63	80	16	65	14	51	8	36	6	56	-	-	-											-							-	-
5	20	63	80	80	56	4	9	3	14	2	11	-	-	-											-							-	-
6	3	63	35	43	80	15	51	6	65	4	32	-	-	-											-							-	-
6	17	63	80	41	58	11	51	7	26	4	37	-	-	-											-							-	-
7	1	63	47	39	70	7	83	6	80	4	44	-	-	-											-							-	-
7	15	63	80	35	82	28	26	7	47	6	24	-	-	-											-							-	-
8	5	63	56	44	47	16	26	11	80	8	21	-	-	-											-							-	-
8	19	63	58	22	80	19	56	17	26	12	30	-	-	-											-							-	-
9	2	63	26	39	27	11	58	10	47	10	30	-	-	-											-							-	-
9	16	63	92	19	58	18	47	14	56	11	38	-	-	-											-							-	-

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE AND LOWER SNAKE RIVER

STATION LOCATION SNAKE RIVER AT
ICE HARBOR DAM, WASHINGTON 115

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	1	62	10	8	4665	102	31	71	1	9	11	1	1	9	0	3	1	1	5
11	5	62	11	12	4974	110	27	83	1	8	9	0	1	8	0	3	1	1	4
12	3	62	12	10	4653	102	22	80	1	6	7	1	1	5	0	2	1	1	4
1	7	63	1	14	4815	107	25	82	1	7	9	1	1	7	0	3	1	1	3
2	7	63	2	14	4637	110	37	73	1	10	12	1	1	9	1	3	2	1	8
3	4	63	3	11	4915	101	24	77	1	7	8	1	1	6	0	2	1	1	4
4	1	63	4	7	4382	107	38	69	1	11	11	1	1	8	1	4	2	1	8
5	6	63	5	13	4740	108	32	76	2	9	9	1	1	7	0	4	2	1	5
6	3	63	6	10	4802	123	57	66	4	16	14	2	1	11	0	7	6	1	9
7	1	63	7	8	4845	107	47	60	1	14	11	1	1	9	0	5	5	1	10
8	5	63	8	12	4700	102	40	62	-	-	-	-	-	-	-	-	-	-	-
9	2	63	9	9	4767	85	24	61	0	7	8	0	1	7	0	3	1	1	4

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE: WASHINGTON
MAJOR BASIN: PACIFIC NORTHWEST
MINOR BASIN: MIDDLE AND LOWER SNAKE RIVER
STATION LOCATION: SNAKE RIVER AT ICE HARBOR DAM, WASHINGTON 115

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	8	62	-	-	7.8	-	-	-	-	-	17	120	120	5	*25	48	.0	248	-
10	16	62	-	-	7.8	-	-	-	-	-	14	102	100	5	*25	30	.0	232	-
10	23	62	-	-	-	-	-	-	-	-	10	88	80	20	*25	32	.0	160	-
10	29	62	-	-	7.5	-	-	-	-	-	9	92	110	10	*25	37	.0	185	-
11	5	62	-	-	8.1	-	-	-	-	-	9	62	144	5	*25	19	.0	189	-
11	11	62	-	-	8.0	-	-	-	-	-	16	168	256	0	*25	215	.0	535	-
11	19	62	-	-	7.7	-	-	-	-	-	50	102	120	5	*25	46	.0	305	-
11	26	62	-	-	8.0	-	-	-	-	-	6	82	84	5	*25	25	.0	150	-
12	3	62	-	-	7.9	-	-	-	-	-	7	82	164	5	*25	25	.0	163	-
12	10	62	-	-	7.9	-	-	-	-	-	-	92	92	5	*25	31	.0	240	-
12	17	62	-	-	8.1	-	-	-	-	-	12	96	104	5	*25	34	.0	190	-
12	24	62	-	-	7.7	-	-	-	-	-	8	84	104	-	*25	28	.0	150	-
12	31	62	-	-	7.5	-	-	-	-	-	9	95	96	0	*25	28	.0	170	-
1	7	63	-	-	8.1	-	-	-	-	-	19	92	100	-	*25	36	.1	200	-
1	21	63	-	-	7.9	-	-	-	-	-	12	136	128	-	*25	50	.0	305	-
1	28	63	-	-	8.1	-	-	-	-	-	13	110	120	-	*25	35	.0	220	-
2	4	63	-	-	7.9	-	-	-	-	-	14	114	124	5	*25	44	.0	250	-
2	25	63	-	-	7.8	-	-	-	-	-	9	76	80	5	73	25	.0	160	-
3	4	63	-	-	7.9	-	-	-	-	-	5	82	80	10	*25	15	.0	138	-
3	11	63	-	-	7.4	-	-	-	-	-	9	78	80	5	*25	10	.0	141	-
3	18	63	-	-	6.9	-	-	-	-	-	9	84	80	10	*25	120	.0	171	-
3	25	63	-	-	7.0	-	-	-	-	-	9	76	80	10	*25	23	.0	159	-
4	1	63	-	-	7.2	-	-	-	-	-	7	68	68	5	*25	20	.0	120	-
4	8	63	-	-	7.7	-	-	-	-	-	9	64	63	10	*25	18	.0	108	-
4	15	63	-	-	7.3	-	-	-	-	-	6	56	56	5	*25	15	.0	93	-
4	22	63	-	-	7.2	-	-	-	-	-	5	68	64	10	*25	15	.0	115	-
4	29	63	-	-	-	-	-	-	-	-	9	72	68	5	*25	20	.0	108	-
5	6	63	-	-	-	-	-	-	-	-	11	64	52	5	*25	14	.0	103	-
5	13	63	-	-	-	-	-	-	-	-	6	68	60	5	*25	12	.0	91	-
5	20	63	-	-	-	-	-	-	-	-	7	56	56	5	*25	17	.0	118	-
5	27	63	-	-	-	-	-	-	-	-	4	32	44	10	*25	8	.0	62	-
6	3	63	-	-	-	-	-	-	-	-	6	42	44	5	*25	13	.0	59	-
6	10	63	-	-	-	-	-	-	-	-	11	46	52	0	*25	14	.0	84	-
6	17	63	-	-	-	-	-	-	-	-	8	46	52	10	*25	14	.0	106	-
6	24	63	-	-	-	-	-	-	-	-	6	50	52	5	*25	17	.0	110	-
7	1	63	-	-	-	-	-	-	-	-	7	60	68	5	*25	17	.0	109	-
7	9	63	-	-	-	-	-	-	-	-	6	52	72	5	*25	14	.0	127	-
7	15	63	-	-	-	-	-	-	-	-	7	54	56	5	*25	14	.0	82	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE: WASHINGTON
MAJOR BASIN: PACIFIC NORTHWEST
MINOR BASIN: MIDDLE AND LOWER SNAKE RIVER
STATION LOCATION: SNAKE RIVER AT ICE HARBOR DAM, WASHINGTON 115

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	22	63	-	-	-	-	-	-	-	-	6	58	60	5	*25	17	•0	100	-
7	29	63	-	-	-	-	-	-	-	-	9	64	70	5	*25	18	•0	113	-
8	5	63	-	-	-	-	-	-	-	-	10	72	82	10	*25	21	•0	125	-
8	12	63	-	-	-	-	-	-	-	-	12	78	82	0	*25	24	•0	151	-
8	19	63	-	-	-	-	-	-	-	-	13	86	84	0	*25	28	•0	157	-
8	26	63	-	-	-	-	-	-	-	-	11	90	96	5	*25	32	•0	117	-
9	2	63	-	-	-	-	-	-	-	-	10	94	94	0	*25	31	•0	170	-
9	9	63	-	-	-	-	-	-	-	-	11	100	98	10	*25	36	•0	187	-
9	23	63	-	-	-	-	-	-	-	-	14	114	104	5	*25	44	•0	222	-
9	30	63	-	-	-	-	-	-	-	-	15	116	112	5	*25	47	•0	229	-

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station near Clarkston, Washington
Operated by U.S. Geological Survey

STATE: Washington

MAJOR BASIN: Pacific Northwest

MINOR BASIN: Middle and Lower Snake River

STATION LOCATION: Snake River at Ice Harbor Dam, Washington

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	25.000	30.800	39.000	34.000	28.500	47.000	44.000	67.400	142.000	70.200	23.900	18.500
2	25.300	30.700	39.200	31.200	27.500	47.300	44.500	75.700	132.000	64.600	23.800	18.200
3	26.000	29.000	41.100	34.300	34.500	44.000	41.300	78.000	125.000	63.200	23.500	21.000
4	25.200	27.000	45.300	36.600	55.800	42.500	38.600	78.200	122.000	56.500	23.000	24.000
5	25.400	28.100	43.800	35.600	75.000	40.000	37.800	78.100	130.000	50.000	22.500	23.200
6	25.300	31.500	42.200	34.100	76.500	40.000	40.500	80.900	144.000	46.800	23.000	24.000
7	24.000	33.500	41.400	28.900	79.100	38.900	48.000	90.000	128.000	46.000	22.600	23.800
8	22.300	29.600	41.600	34.000	74.900	37.500	51.600	96.200	119.000	44.600	22.500	21.000
9	27.300	29.000	39.100	33.000	65.000	37.000	53.500	92.900	116.000	45.800	22.200	18.700
10	29.000	30.700	38.500	33.800	58.500	36.400	53.200	88.000	124.000	42.900	22.300	21.700
11	32.500	33.600	37.700	30.700	54.100	34.000	53.700	83.100	120.000	40.500	22.200	23.500
12	39.300	29.600	35.500	29.800	50.900	36.000	51.000	81.000	118.000	41.400	23.200	22.900
13	54.200	31.700	34.000	26.100	47.100	33.500	47.400	76.500	118.000	39.500	23.000	22.900
14	55.500	34.500	32.700	26.200	45.700	32.500	44.600	84.600	121.000	36.800	23.500	22.000
15	56.000	33.100	34.000	31.700	45.200	33.000	48.000	87.500	123.000	34.900	23.500	20.800
16	56.100	31.800	35.100	31.800	45.100	33.000	59.300	85.000	127.000	35.300	21.900	20.700
17	47.100	30.000	37.100	32.900	44.200	32.500	53.700	90.700	129.000	33.800	21.900	24.200
18	41.300	31.000	49.200	36.000	41.800	31.000	54.000	95.800	120.000	32.400	21.800	26.000
19	37.000	29.000	53.000	36.900	45.600	31.100	55.400	105.000	112.000	32.900	20.000	25.500
20	37.700	31.900	50.800	32.000	51.700	30.800	52.500	112.000	114.000	31.500	20.100	25.500
21	36.700	59.100	48.400	28.500	54.000	32.100	56.100	121.000	110.000	30.600	20.500	26.200
22	35.700	56.500	46.500	32.600	50.700	33.900	50.700	125.000	111.000	30.200	20.000	24.700
23	35.100	43.600	42.200	32.000	49.100	36.800	50.900	136.000	104.000	29.900	19.600	24.500
24	35.000	40.500	39.500	33.200	47.000	37.600	51.900	142.000	102.000	28.000	19.200	25.200
25	34.500	36.300	34.200	33.600	43.100	36.800	50.800	151.000	97.900	27.600	19.800	26.900
26	33.800	36.500	28.900	30.900	45.900	38.500	49.000	144.000	90.000	26.400	19.400	27.500
27	32.400	44.000	34.500	25.000	50.800	37.900	50.900	141.000	84.600	26.000	19.700	26.200
28	31.200	43.800	36.000	22.200	48.500	40.800	56.300	134.000	74.800	25.200	21.100	25.900
29	30.900	43.500	36.000	26.500		46.700	55.600	130.000	71.000	25.300	21.600	26.800
30	31.100	40.500	36.300	26.500		50.900	59.000	133.000	76.500	25.300	21.900	23.300
31	32.500		32.800	27.400		47.600		139.000		24.000	21.500	

SNAKE RIVER AT WAWAWAI, WASHINGTON

This Pollution Surveillance System station is located at the pumping station of the I. E. Wilson Farm about 25 miles below the point where the Snake River turns westward and starts to flow entirely through Washington. Clarkston, Washington and Lewiston, Idaho are the two major communities 25 miles upstream that may influence water quality at this station. These cities contribute 7,800 BOD population equivalents through treated sewage. Pulp mill wastes are also discharged to the river in the Lewiston-Clarkston area.

Irrigation water is diverted from the stream principally in the southern Idaho portion of the drainage.

The Clearwater River is a tributary to the Snake River at Lewiston, Idaho.

Station Location: Snake River at Wawawai, Washington

Major Basin: Pacific Northwest

Minor Basin: Middle and Lower Snake River

Station at: 46°38' Latitude 117°23' Longitude

Miles above mouth: 111

Activation Date: August 4, 1958

Sampled by: Washington State University

Field Analysis by: Washington State University

Other Cooperating Agencies: Washington State Department of Health

Hydrologic Data:

Nearest pertinent gaging station: near Clarkston, Washington

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 103,200 square miles

Period of record: 1915 to present

Average discharge in record period: 45,140 cfs. (for 1962 water year only)

Maximum discharge in record period: 369,000 cfs.

Minimum discharge in record period: 6,660 cfs.

Remarks: Diversion for irrigation of more than 2.8 million acres above gaging station. Regulated by upstream storage reservoirs and affected by power plant operation.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.46	.25
	Na	26	9.4
	K	3.3	1.5
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	*4	3
	Cd	*2	*2
	As	*20	*10
	B	47	14
	P	*5	*5
	Fe	80	6
	Mo	*2	2
	Mn	*1	*.9
	Al	—	6
	Be	*.05	*.02
	Cu	4	6
	Ag	*.4	*.2
	Ni	*2	1
	Co	*4	*2
	Pb	*5	*2
	Cr	*1	*2
	V	*2	9
	Ba	31	7
	Sr	150	25

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	.7	.2	April to June	.9	.2
January to March	—	—	July to September	—	—

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE: WASHINGTON
MAJOR BASIN: PACIFIC NORTHWEST
MINOR BASIN: MIDDLE AND LOWER SNAKE RIVER
STATION LOCATION: SNAKE RIVER AT WAWAWAI, WASHINGTON

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA							GROSS ACTIVITY		
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL			ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±		pc/g	±	pc/g	±
10	1	62	11	15	-	-	-	-	-	-	20	5	16	8	36	10					
10	8	62	11	19	-	-	-	-	-	-	2	6	6	9	8	11					
10	15	62	11	13	-	-	-	-	-	-	21	6	22	6	43	8					
10	22	62	11	17	0	1	2	1	2	1	3	6	30	8	33	10					
10	29	62	11	26	-	-	-	-	-	-	14	5	24	6	38	8					
12	31	62	1	24*	0	0	2	1	2	1	5	6	18	8	23	10					
1	27	63	2	21*	0	0	3	1	3	1	1	7	15	9	16	11					
2	25	63	3	18*	1	1	1	1	2	1	42	4	24	4	66	6					
3	25	63	4	17*	1	1	0	1	1	1	19	7	22	7	41	10					
4	29	63	5	22*	0	1	0	1	0	1	17	6	22	7	39	9					
5	27	63	6	19*	0	1	1	1	1	1	21	7	14	6	35	9					
6	24	63	7	23*	0	1	1	1	1	1	1	5	19	6	20	8					
7	29	63	8	19*	0	0	1	1	1	1	6	3	16	3	22	4					
8	26	63	9	25*	1	1	2	2	3	2	24	7	21	8	45	11					
9	30	63	10	29*	0	0	3	1	3	1	0	6	20	8	26	10					

PLANKTON POPULATION

STATE WASHINGTON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN MIDDLE AND LOWER SNAKE RIVER
STATION LOCATION SNAKE RIVER AT
WAWAWAI, WASHINGTON

DATE OF SAMPLE			ALGAE (Number per milliliter)										INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	2000	0	0	170	0	0	0	210	1660	80	410	92	2	82	1	97	1	68	1											
10	15	62	700	0	10	20	0	0	0	60	650	60	1050																			
11	5	62	300	0	0	0	0	0	0	0	300	50	330																			
11	19	62	500	0	0	20	0	0	0	60	440	90	290																			
12	3	62	700	0	0	0	0	0	0	120	580	40	120																			
12	17	62	300	20	0	0	0	0	0	50	210	80	290																			
1	7	63	200	0	0	0	0	0	0	0	200	240	130																			
1	21	63	400	0	0	20	0	20	0	150	210	340	250																			
2	4	63	1400	0	0	80	0	60	0	170	1110	290	3470	88	1	73	1															
2	18	63	900	0	0	0	0	20	130	530	270	630	250																			
3	4	63	300	0	0	20	0	70	70	20	150	110	370																			
3	18	63	400	0	0	0	0	40	20	0	310	90	350																			
4	1	63	500	0	0	20	0	40	0	20	440	40	860																			
4	15	63	600	0	0	60	0	0	60	40	440	20	320	73	1	82	1															
5	6	63	500	0	0	0	0	0	0	150	330	90	750																			
5	21	63	800	0	0	0	0	0	0	480	330	260	750	71	2																	
6	3	63	300	0	0	40	0	0	0	70	150	70	330																			
6	17	63	200	0	0	0	0	0	0	40	130	20	70																			
7	1	63	100	0	0	20	0	0	0	20	100	40	270																			
7	15	63	800	0	0	40	0	0	0	270	460	80	330	92	1																	
8	5	63	2700	50	100	370	0	120	0	390	1650	120	3050	82	2	88	2	92	2	69	1	87	1									
8	19	63	1500	0	0	390	0	20	0	390	730	240	2240	68	2	92	1	88	1													
9	2	63	900	20	0	170	0	40	0	190	450	300	1010																			
9	17	63	1400	20	0	20	0	110	0	500	750	110	1060	68	2	88	1	87	1													

PLANKTON POPULATION

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE AND LOWER SNAKE RIVER

STATION LOCATION SNAKE RIVER AT

WAWAWAI, WASHINGTON 049

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml.)	MICROINVERTEBRATES																				
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) (Number per ml.)	ROTIFERS — GENERA AND COUNT LEVEL (See text for Codes)											CRUSTACEA — GENERA AND COUNT LEVEL (See text for Codes)							NEMATODES (Identifiable) (Number per liter)	OTHER ANIMAL FORMS (Number per liter)
														NUMBER PER LITER	1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	1	62	92	15	36	14	58	12	41	8	51	0	0	2											0							2	0
10	15	62	41	18	92	15	16	9	36	9	49	20	0	4											0							0	0
11	5	62	36	12	16	11	56	6	64	8	61	0	0	0											0							0	0
11	19	62	92	10	56	10	36	9	58	6	65	-	-	0											0							0	0
12	3	62	56	26	36	12	92	10	97	7	45	-	-	0											0							0	0
12	17	62	56	13	36	9	92	8	71	6	64	-	-	1											0							2	0
1	7	63	56	21	82	13	9	9	80	6	51	-	-	0											0							0	0
1	21	63	56	37	9	11	80	9	71	8	35	-	-	2											0							0	0
2	4	63	71	12	2	12	51	10	1	6	60	-	-	-											-							-	-
2	18	63	82	10	2	8	36	8	46	7	67	-	-	0											0							0	0
3	4	63	82	18	71	7	2	6	36	5	64	-	-	0											0							0	0
3	18	63	51	13	36	12	31	7	70	6	62	-	-	0											0							0	0
4	1	63	51	12	65	12	92	9	2	9	58	-	-	0											0							0	0
4	15	63	2	21	36	13	51	7	65	7	52	-	-	2											0							0	0
5	6	63	80	11	36	10	82	6	65	5	68	-	-	-											-							-	-
5	21	63	80	32	82	10	35	7	14	5	46	-	-	-											-							-	-
6	3	63	80	18	35	16	36	6	9	6	54	-	-	-											-							-	-
6	17	63	80	16	92	8	36	6	9	6	64	-	-	-											-							-	-
7	1	63	47	68	92	8	80	3			21	-	-	-											-							-	-
7	15	63	58	56	56	23	26	7			14	-	-	-											-							-	-
8	5	63	36	29	70	17	92	16	65	5	33	-	-	-											-							-	-
8	19	63	92	28	70	10	70	9	36	6	47	-	-	-											-							-	-
9	2	63	58	36	47	19	92	12	64	5	28	-	-	-											-							-	-
9	17	63	58	19	26	15	64	8	92	7	51	-	-	-											-							-	-

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE AND LOWER SNAKE RIVER

STATION LOCATION SNAKE RIVER AT
WAWAWAI, WASHINGTON

DATE OF SAMPLE					GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES									
BEGINNING			END								NEUTRALS							
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLORO-FORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
12	14	62	12	27	5150	142	34	108	1	7	16	2	2	12	0	5	2	1	2
12	31	62	1	10	6252	70	26	44	1	5	12	2	2	7	1	4	1	0	3
2	4	63	2	13	5520	85	21	64	0	5	9	1	1	6	1	3	1	1	2
3	4	63	3	13	4850	316	47	269	1	13	15	1	1	12	1	5	3	1	9
4	1	63	4	11	5160	92	39	53	2	9	12	1	1	9	1	4	2	0	10
5	1	63	5	19	5070	109	52	57	2	14	16	3	2	11	0	6	4	1	9
6	1	63	8	5	2360#	173	56	117	1	12	29	1	2	25	1	6	2	1	5
8	5	63	8	11	3050	171	71	100	2	20	22	1	2	18	1	9	6	1	11
8	26	63	9	11	4020	156	73	83	3	19	22	1	2	18	1	12	6	1	10
9	30	63	10	10	5110	134	50	84	3	13	14	1	1	11	1	6	4	1	9

ESTIMATED

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN MIDDLE AND LOWER SNAKE RIVER

STATION LOCATION SNAKE RIVER AT

WAWAWAI, WASHINGTON 49

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	1	62	18.0	9.6	8.1	.8	13	1.1	2.9	.1	14	110	104	18	3	36	.0	205	6200
10	8	62	15.9	11.1	8.2	1.0	15	1.3	-	.0	15	116	123	-	0	49	.1	238	1100
10	15	62	11.5	10.1	7.6	1.5	17	.9	8.0	.3	12	58	62	42	36	21	.1	129	900
10	22	62	12.6	10.1	8.0	1.3	17	1.6	3.2	.1	12	97	99	19	5	34	.1	185	100
10	29	62	12.2	10.8	8.2	.3	10	.6	-	.1	11	105	106	17	5	35	.0	199	400
11	5	62	11.5	10.6	8.4	.7	11	.7	2.4	.1	13	111	112	19	3	36	.1	211	200
11	12	62	9.5	10.8	8.0	1.7	10	1.3	3.7	.0	14	103	108	20	7	37	.1	212	500
11	19	62	9.6	11.1	7.8	.7	-	-	-	-	15	129	117	3	8	40	.1	234	*50
11	26	62	6.2	11.6	8.2	3.0	13	1.2	5.1	.1	10	80	82	9	7	40	.1	165	100
12	3	62	6.2	11.8	7.8	.9	12	1.2	3.0	.1	12	86	97	5	10	35	.1	175	4800
12	10	62	6.0	12.1	7.2	-	10	.9	1.8	.1	12	89	99	5	10	31	.1	192	200
12	17	62	5.7	11.9	7.7	-	11	1.3	2.8	.1	11	73	97	4	5	43	.1	196	900
12	24	62	5.8	13.7	7.6	1.6	11	.8	2.7	.0	11	76	90	10	12	29	.1	159	400
12	31	62	4.8	12.7	8.0	2.0	11	.7	2.8	.0	12	76	95	6	10	36	.1	187	*50
1	7	63	5.8	12.7	8.1	-	9	1.0	3.3	.0	14	94	112	8	8	38	.1	178	100
1	14	63	3.5	13.1	7.8	2.0	11	.9	4.0	.1	18	139	147	3	18	55	.1	282	50
1	21	63	3.6	13.0	8.0	-	10	1.3	2.5	-	17	124	129	7	8	39	.1	269	-
1	27	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1500
1	28	63	3.5	13.1	8.0	-	10	.7	2.8	.0	15	124	122	5	11	44	.1	250	-
2	4	63	2.5	13.1	7.5	-	63	-	7.6	.0	10	84	74	29	400	24	.3	145	11000
2	11	63	3.0	12.9	6.7	1.7	9	1.1	3.5	.1	10	86	76	23	48	26	.2	152	400
2	18	63	4.5	12.4	8.2	1.6	12	.7	-	.0	12	97	92	20	34	28	.0	174	6000
2	25	63	4.8	12.1	8.2	1.9	11	.6	3.4	.1	11	82	80	-	39	29	.3	148	2400
3	4	63	5.0	12.0	8.3	2.1	-	1.1	-	.1	9	74	75	-	10	27	.2	142	100
3	11	63	6.0	11.5	8.0	.0	9	.5	-	.1	10	86	84	16	9	25	.3	158	5000
3	18	63	6.4	11.2	8.1	.5	12	-	-	.0	10	82	78	19	13	23	.2	150	160
3	25	63	8.0	11.0	8.1	.2	11	-	-	.0	8	66	62	21	23	16	.1	131	450
4	1	63	8.0	11.4	7.8	-	13	1.1	3.9	.1	7	58	53	18	33	22	.0	115	730
4	8	63	9.2	11.3	8.1	-	17	1.1	3.8	-	6	53	51	10	17	18	.8	104	680
4	15	63	10.0	10.7	8.0	.9	10	1.0	3.1	.1	8	61	57	12	15	22	.0	118	800
4	22	63	8.8	11.4	7.9	1.3	12	1.6	2.9	.1	9	77	64	15	23	23	.1	138	260
4	29	63	10.7	10.6	8.1	.7	14	1.6	4.5	.2	7	65	64	20	63	22	.0	130	700
5	6	63	10.8	11.1	8.2	1.3	14	1.2	3.8	.1	9	63	58	12	27	-	.3	-	630
5	13	63	11.0	11.3	8.2	1.3	11	1.3	3.0	.1	8	48	46	13	15	17	.0	93	-
5	20	63	13.2	10.4	8.1	.7	15	1.6	4.8	.1	10	44	44	17	36	19	.1	82	-
5	27	63	12.8	10.4	7.9	.6	14	1.3	4.1	.1	8	34	42	15	42	18	-	65	200
6	3	63	13.5	10.0	7.7	.6	13	1.0	3.1	.1	3	41	40	14	17	15	.1	78	100
6	10	63	13.7	10.3	8.2	.7	10	1.1	2.8	.1	3	46	46	14	10	15	.1	81	580

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE: WASHINGTON
MAJOR BASIN: PACIFIC NORTHWEST
MINOR BASIN: MIDDLE AND LOWER SNAKE RIVER
STATION LOCATION: SNAKE RIVER AT WAWAWAI, WASHINGTON

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
6	17	63	17.0	9.7	8.9	.8	11	–	–	.1	4	42	46	27	9	–	.2	95	1100
6	24	63	15.5	9.5	8.1	1.1	12	1.1	2.6	.1	5	52	54	–	24	15	.0	102	400
7	1	63	16.5	9.3	7.9	.6	10	.6	2.9	.0	5	50	52	22	16	14	.1	96	110
7	8	63	20.5	9.3	8.3	1.0	10	1.0	2.5	.1	4	50	48	20	7	12	.0	96	3400
7	15	63	20.0	8.6	8.2	1.0	11	1.7	2.8	.1	5	54	48	23	7	–	.0	120	1100
7	22	63	21.0	8.1	8.3	1.8	11	1.0	3.4	.1	3	68	46	23	7	17	.0	112	1300
7	29	63	21.5	9.4	9.5	1.3	12	1.1	3.0	.2	7	52	78	–	8	20	.0	132	300
8	5	63	23.0	8.5	8.8	1.8	13	–	3.7	.1	7	76	84	–	13	23	.0	145	85
8	12	63	24.0	7.5	8.3	1.2	14	1.4	4.4	.1	7	90	94	–	11	24	.1	165	730
8	19	63	21.5	7.9	8.3	2.4	24	2.1	–	.1	10	106	100	14	115	26	.1	184	2600
8	26	63	20.5	8.3	9.0	2.6	16	3.1	6.1	.1	10	98	96	24	29	32	.2	185	100
9	2	63	22.0	9.1	8.5	.9	10	.5	1.9	.1	11	104	110	21	5	37	.1	192	500
9	9	63	21.0	8.1	8.2	1.1	12	1.5	3.9	.1	13	106	106	24	13	39	.1	214	400
9	17	63	18.2	8.8	8.4	1.7	19	1.7	4.0	.1	12	102	104	14	24	36	.1	183	75
9	23	63	20.0	7.8	8.0	1.3	16	1.4	4.9	.1	13	110	130	21	20	45	.1	221	1600
9	30	63	20.0	7.7	8.0	1.3	15	1.9	6.7	.1	13	122	130	18	18	11	1.0	233	120

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station near Clarkston, Washington
Operated by U.S. Geological Survey

STATE: Washington

MAJOR BASIN: Pacific Northwest

MINOR BASIN: Middle and Lower Snake River

STATION LOCATION: Snake River at Wawawai, Washington

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	25.000	30.800	39.000	34.000	28.500	47.000	44.000	67.400	142.000	70.200	23.900	18.500
2	25.300	30.700	39.200	31.200	27.500	47.300	44.500	75.700	132.000	64.600	23.800	18.200
3	26.000	29.000	41.100	34.300	34.500	44.000	41.300	78.000	125.000	63.200	23.500	21.000
4	25.200	27.000	45.300	36.600	55.800	42.500	38.600	78.200	122.000	56.500	23.000	24.000
5	25.400	28.100	43.800	35.600	75.000	40.000	37.800	78.100	130.000	50.000	22.500	23.200
6	25.300	31.500	42.200	34.100	76.500	40.000	40.500	80.900	144.000	46.800	23.000	24.000
7	24.000	33.500	41.400	28.900	79.100	38.900	48.000	90.000	128.000	46.000	22.600	23.800
8	22.300	29.600	41.600	34.000	74.900	37.500	51.600	96.200	119.000	44.600	22.500	21.000
9	27.300	29.000	39.100	33.000	65.000	37.000	53.500	92.900	116.000	45.800	22.200	18.700
10	29.000	30.700	38.500	33.800	58.500	36.400	53.200	88.000	124.000	42.900	22.300	21.700
11	32.500	33.600	37.700	30.700	54.100	34.000	53.700	83.100	120.000	40.500	22.200	23.500
12	39.300	29.600	35.500	29.800	50.900	36.000	51.000	81.000	118.000	41.400	23.200	22.900
13	54.200	31.700	34.000	26.100	47.100	33.500	47.400	76.500	118.000	39.500	23.000	22.900
14	55.500	34.500	32.700	26.200	45.700	32.500	44.600	84.600	121.000	36.800	23.500	22.000
15	56.000	33.100	34.000	31.700	45.200	33.000	48.000	87.500	123.000	34.900	23.500	20.800
16	56.100	31.800	35.100	31.800	45.100	33.000	59.300	85.000	127.000	35.300	21.900	20.700
17	47.100	30.000	37.100	32.900	44.200	32.500	53.700	90.700	129.000	33.800	21.900	24.200
18	41.300	31.000	49.200	36.000	41.800	31.000	54.000	95.800	120.000	32.400	21.800	26.000
19	37.000	29.000	53.000	36.900	45.600	31.100	55.400	105.000	112.000	32.900	20.000	25.500
20	37.700	31.900	50.800	32.000	51.700	30.800	52.500	112.000	114.000	31.500	20.100	25.500
21	36.700	59.100	48.400	28.500	54.000	32.100	56.100	121.000	110.000	30.600	20.500	26.200
22	35.700	56.500	46.500	32.600	50.700	33.900	50.700	125.000	111.000	30.200	20.000	24.700
23	35.100	43.600	42.200	32.000	49.100	36.800	50.900	136.000	104.000	29.900	19.600	24.500
24	35.000	40.500	39.500	33.200	47.000	37.600	51.900	142.000	102.000	28.000	19.200	25.200
25	34.500	36.300	34.200	33.600	43.100	36.800	50.800	151.000	97.900	27.600	19.800	26.900
26	33.800	36.500	28.900	30.900	45.900	38.500	49.000	144.000	90.000	26.400	19.400	27.500
27	32.400	44.000	34.500	25.000	50.800	37.900	50.900	141.000	84.600	26.000	19.700	26.200
28	31.200	43.800	36.000	22.200	48.500	40.800	56.300	134.000	74.800	25.200	21.100	25.900
29	30.900	43.500	36.000	26.500		46.700	55.600	130.000	71.000	25.300	21.600	26.800
30	31.100	40.500	36.900	26.500		50.900	59.000	133.000	76.500	25.300	21.900	23.300
31	32.500		32.800	27.400		47.600		139.000		24.000	21.500	

736-491 O—64——9

SNAKE RIVER AT PAYETTE, IDAHO

The Payette station of the Water Pollution Surveillance System is located at the highway bridge crossing the Snake River. It is the uppermost station along the Snake River and is located in the reach of the river forming the Oregon-Idaho border. Municipal wastes with a total BOD population equivalent of approximately 13,000 are discharged to the Snake River within 4 miles upstream of the station.

Upstream from the station, about 2.5 million acres are under irrigation with sugar beets, potatoes, and grains being the principal crops. Wastes from food processing plants associated with these crops enter the Snake River and its tributaries above the Payette station.

Station Location:	Snake River at Payette, Idaho
Major Basin:	Pacific Northwest
Minor Basin:	Central Snake River
Station at:	44°06' Latitude 116°56' Longitude
Miles above mouth:	366
Activation Date:	October 2, 1961
Sampled by:	Payette Water Department
Field Analysis by:	Idaho State Department of Health
Other Cooperating Agencies:	None
Hydrologic Data:	
Nearest pertinent gaging station:	at Weiser, Idaho
Gaging station operated by:	U.S. Geological Survey
Drainage area at gaging station:	69,200 square miles
Period of record:	1910 to present
Average discharge in record period:	13,600 cfs. (1962 water year only)

Maximum discharge in record period: 84,500 cfs.

Minimum discharge in record period: 5,100 cfs.

Remarks: Diversion for irrigation of approximately 2.5 million acres above station. Flow affected by upstream power plant and regulated by reservoirs.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.56	.65
	Na	46	20
	K	5.7	3.3
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	90	4
	Cd	*4	*2
	As	*36	*16
	B	95	30
	P	*9	16
	Fe	155	5
	Mo	*7	21
	Mn	*1.8	3.3
	Al	—	*8
	Be	*.09	*.04
	Cu	13	7
	Ag	*.7	.5
	Ni	*4	*6
	Co	*7	*4
	Pb	*10	*16
	Cr	*2	*4
	V	*4	*16
	Ba	59	15
	Sr	288	51

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	.8	.3	April to June	1.5	.2
January to March	—	—	July to September	—	—

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.

See page 21.

RADIOACTIVITY DETERMINATIONS

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN CENTRAL SNAKE RIVER

STATION LOCATION SNAKE RIVER AT PAYETTE, IDAHO

DATE SAMPLE TAKEN			DATE OF DETERMINATION		RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON				
					ALPHA						BETA						DATE OF DETERMINATION	GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL			ALPHA		BETA	
MO.	DAY	YR	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO. DAY	pc/g	±	pc/g	±
10	3	62	12	13	0	1	6	3	6	3	5	7	24	10	29	12					
10	10	62	11	2	0	1	3	3	3	3	1	10	23	17	24	20					
10	17	62	11	8	0	0	2	2	2	2	8	5	17	9	25	10					
10	24	62	11	21	0	0	5	3	5	3	6	6	19	9	25	11					
10	31	62	11	26	0	1	5	2	5	2	6	3	12	4	18	5					
11	7	62	12	27	0	1	2	2	2	2	6	11	32	16	38	19					
11	21	62	12	6	1	1	3	2	4	2	1	6	19	9	20	11					
11	26	62	12	15	0	0	1	1	1	1	21	6	36	7	57	9					
12	5	62	1	2	0	1	5	3	5	3	9	9	32	11	41	14					
12	12	62	1	3	0	0	5	2	5	2	5	6	22	9	27	11					
12	19	62	1	7	1	1	3	2	4	2	18	4	23	6	41	7					
1	30	63	2	19*	0	0	5	2	5	2	10	7	27	9	37	11					
2	27	63	3	22*	1	1	3	2	4	2	28	7	33	9	61	11					
3	27	63	4	22*	0	1	0	1	0	1	9	3	34	4	43	5					
4	18	63	6	3*	0	1	2	1	2	1	47	4	28	4	75	6					
5	29	63	6	25*	0	1	1	1	1	1	20	7	25	7	45	10					
6	26	63	7	30*	1	1	2	1	3	1	23	7	26	8	49	11					
7	31	63	8	27*	0	1	3	2	3	2	9	6	30	9	39	11					
8	28	63	10	10*	0	1	4	2	4	2	8	6	16	9	24	11					
9	27	63	11	6*	0	0	4	2	4	2	7	6	15	9	22	11					

PLANKTON POPULATION

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN CENTRAL SNAKE RIVER

STATION LOCATION SNAKE RIVER AT PAYETTE, IDAHO

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILA-MENT-OUS	COCCOID	FILA-MENT-OUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	3	62	26500	0	0	540	0	0	0	24440	1490	2300	2030	71	8	69	4	92	3	68	3	82	1									
10	17	62	2100	30	30	90	0	0	0	1490	450	1170	570	69	3	71	3															
11	7	62	22000	170	250	500	0	120	0	15300	5670	2570	460	71	7	68	5	87	4	92	3	82	1	88	1	16	1	3	1			
11	21	62	1200	0	0	50	0	70	0	410	720	700	1190	82	2	87	1															
12	5	62	9900	0	100	150	0	60	0	4800	4760	4930	210	71	5	82	5	68	3	87	3	92	2	79	1	69	1	81	1			
12	19	62	2600	0	0	20	0	20	0	790	1740	2220	1800	87	3	71	2	82	2	79	1	88	1	68	1							
1	2	63	700	0	0	0	0	20	0	130	590	150	460	87	1	82	1															
2	7	63	2800	0	0	20	0	70	0	1630	1080	480	950	71	4	87	3	68	1													
2	20	63	1700	0	0	20	0	110	270	570	710	650	1760	87	2	60	1															
3	6	63	8800	0	150	320	0	210	80	7410	590	2480	2630	71	6	87	2	26	1	51	1	88	1									
3	20	63	6900	190	170	270	0	0	110	4280	1850	3230	1760	71	5	87	3	3	1	17	1											
4	3	63	4000	0	0	0	0	110	130	1740	2060	1970	4850	71	4	82	3	77	2	87	2	92	1	97	1	88	1					
5	1	63	3300	0	0	0	0	40	0	1940	1320	420	590	71	4	77	2	87	1	88	1											
5	8	63	3900	0	20	70	0	40	0	2050	1670	1100	1830	71	4	77	3	88	1	87	1											
5	22	63	10500	0	20	150	0	0	0	8930	1340	3150	2420	77	2	92	1															
6	3	63	3800	0	0	40	20	20	40	2120	1530	570	420	71	4	88	1	77	1	87	1	92	1									
6	19	63	1600	20	0	50	0	70	0	500	1000	860	1000	71	2	87	1															
7	3	63	19900	0	20	920	0	20	60	17800	1040	1100	120	71	7	24	2	87	1	82	1	88	1									
7	17	63	44700	40	0	3810	0	420	220	38980	1250	8250	1210	71	9	24	4	51	2	32	2	34	2	38	2	26	1	84	1	25	1	69	1
7	31	63	14000	0	30	5460	0	170	0	6220	2170	7770	4310	71	6	34	5	92	4	68	3	38	2	25	1	44	1	84	1			
8	14	63	19700	40	20	2620	0	1360	40	12830	2820	1960	1120	71	7	92	4	69	4	51	4	68	3	38	2	32	2	29	2	24	2	87	2
9	4	63	4600	0	0	240	0	280	0	2540	1510	840	1810	71	4	92	4	51	1	69	1											
9	18	63	21000	270	0	270	0	50	0	19710	670	960	1460	71	7	68	3	87	1	2	1	92	1									

PLANKTON POPULATION

STATE IDAHO
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN CENTRAL SNAKE RIVER
STATION LOCATION SNAKE RIVER AT PAYETTE, IDAHO

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml.)	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH					ROTIFERS										CRUSTACEA											
															GENERA AND COUNT LEVEL (See text for Codes)											GENERA AND COUNT LEVEL (See text for Codes)									
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT		PROTOZOA (Identity/abundance) Number per ml.	NUMBER PER LITER	1ST GENUS	1ST COUNT LEVEL	2ND GENUS	2ND COUNT LEVEL	3RD GENUS	3RD COUNT LEVEL	4TH GENUS	4TH COUNT LEVEL	5TH GENUS	5TH COUNT LEVEL	NUMBER PER LITER	1ST GENUS	1ST COUNT LEVEL	2ND GENUS	2ND COUNT LEVEL	3RD GENUS	3RD COUNT LEVEL	NEMATODES (Identity/abundance) Number per liter	OTHER ANIMAL FORMS (Number per liter)
10	3	62	82	55	92	9	80	7	58	7	22	-	-	85	22	3	11	2	15	2	17	2	2	1	0							6	2
10	17	62	82	28	80	14	58	8	26	6	44	-	-	103	11	3	21	3	15	2	17	1	13	1	3	52	1					0	0
11	7	62	36	32	65	15	92	14	56	8	31	-	-	129	17	4	11	4	21	2					3	50	1					2	1
11	21	62	97	25	36	22	82	10	65	10	33	90	-	12	11	1									0							0	0
12	5	62	36	43	82	11	65	10	92	6	30	-	-	13	2	1									0							0	0
12	19	62	65	25	36	23	16	7	82	7	38	-	-	1											0							0	1
1	2	63	65	51	82	13	36	12	9	3	21	-	-	0											0							0	0
2	7	63	65	41	82	19	36	5	92	4	31	-	-	0											0							0	0
2	20	63	65	50	36	14	92	4	21	2	30	-	-	1											0							0	0
3	6	63	65	45	82	14	36	10	71	4	27	-	-	0											0							0	0
3	20	63	82	63	9	9	65	7	66	4	17	-	-	33	17	1	21	1	11	1					0							1	0
4	3	63	36	18	80	14	82	9	9	8	51	-	-	165	11	4	17	3	46	3	2	3	21	1	3	50	1					0	0
5	1	63	80	52	9	12	36	4	82	3	29	-	-	-											-							-	-
5	8	63	61	47	9	13	47	12	82	8	20	-	-	-											-							-	-
5	22	63	80	76	82	5	92	4	56	3	12	-	-	-											-							-	-
6	3	63	80	45	82	6	9	5	92	4	40	-	-	-											-							-	-
6	19	63	80	61	47	7	66	5	9	4	23	-	-	-											-							-	-
7	3	63	82	57	47	17	80	9	56	3	14	-	-	-											-							-	-
7	17	63	82	70	47	11	92	9			10	-	-	-											-							-	-
7	31	63	92	53	47	19	82	16	26	2	10	-	-	-											-							-	-
8	14	63	92	40	82	16	47	6	36	6	30	-	-	-											-							-	-
9	4	63	92	65	47	11	83	9	58	5	10	-	-	-											-							-	-
9	18	63	82	74	56	7	58	7	92	3	9	-	-	-											-							-	-

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN CENTRAL SNAKE RIVER

STATION LOCATION SNAKE RIVER AT PAYETTE, IDAHO

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DATE OF SAMPLE					GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES										
BEGINNING			END								NEUTRALS								
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLOROFORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	OXYGENATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
4	24	63	5	13	4950	104	30	74	1	7	15	4	2	9	0	3	3	0	1

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN CENTRAL SNAKE RIVER

STATION LOCATION SNAKE RIVER AT PAYETTE, IDAHO

10a

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	3	62	15.5	3.6	8.5	2.4	29	1.3	4.8	-	23	148	180	35	30	103	.0	350	3600
10	10	62	13.5	3.7	7.9	1.0	20	1.3	3.8	-	19	154	192	45	26	65	.1	350	-
10	17	62	10.0	-	8.3	-	19	1.3	3.8	-	19	140	176	45	29	72	.3	310	3300
10	24	62	14.0	8.8	8.4	3.7	18	1.6	4.8	-	24	150	195	45	25	72	.2	320	4000
10	31	62	10.2	8.9	8.2	2.5	16	.9	2.8	-	22	180	188	45	29	72	.0	370	3000
11	7	62	7.7	9.2	8.5	4.1	20	.8	3.8	-	17	186	212	35	25	92	.1	400	-
11	21	62	-	10.0	8.0	3.0	19	.8	3.1	-	23	162	176	35	29	77	.1	340	900
11	28	62	-	9.8	8.1	2.7	21	1.4	2.8	-	17	116	138	45	30	53	.2	280	2100
12	5	62	8.9	9.6	8.5	2.7	18	1.0	2.5	-	25	176	206	45	30	80	.2	330	1300
12	12	62	6.6	10.3	8.4	2.1	19	.8	3.0	-	26	178	210	45	25	81	.2	260	33000
12	19	62	5.5	9.8	7.8	2.0	20	.9	2.8	-	25	142	172	45	25	82	.2	330	7500
1	2	63	4.4	9.7	8.3	1.8	20	1.9	2.0	-	22	140	170	45	25	74	.4	290	18000
1	9	63	2.2	10.5	8.3	2.4	21	3.6	4.6	-	25	154	194	45	25	70	.1	290	2500
1	16	63	.5	12.0	8.1	3.9	19	3.9	5.9	-	21	135	165	45	25	70	.1	240	150
1	23	63	1.1	12.7	8.2	3.5	19	3.6	5.8	-	23	142	173	40	25	71	.1	300	10000
1	30	63	1.2	11.9	8.2	4.2	19	3.6	5.4	-	32	-	208	45	25	76	.1	308	6000
2	6	63	5.7	9.6	8.1	3.3	22	5.5	10.9	-	30	164	196	40	35	76	.1	340	-
2	14	63	5.6	8.7	8.2	2.3	19	5.9	8.3	-	12	146	156	40	40	77	.1	380	-
2	20	63	7.8	9.7	8.1	1.9	22	5.6	7.6	-	19	150	176	35	30	54	.3	330	750
2	27	63	-	9.7	8.1	2.2	19	5.4	7.4	-	23	132	144	40	30	69	.2	300	10000
3	6	63	5.0	9.1	8.3	1.6	21	5.5	9.4	-	25	138	147	35	30	74	.2	310	-
3	7	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11000
3	13	63	4.4	10.2	8.2	2.9	22	5.2	8.3	-	22	145	162	45	30	74	.1	290	500
3	20	63	-	9.5	8.2	1.8	19	4.5	11.4	-	21	147	167	45	30	78	.1	300	20000
3	27	63	10.6	9.3	8.2	4.6	22	4.5	8.6	-	23	146	171	40	30	77	.1	330	7300
4	3	63	7.2	10.0	8.2	1.5	21	3.8	9.5	-	21	148	172	40	30	75	.1	325	7000
4	10	63	7.8	10.7	8.2	2.1	24	5.6	7.8	-	19	142	170	40	45	74	.1	330	21000
5	1	63	7.8	9.1	8.2	2.3	17	4.2	9.8	-	18	110	114	35	29	50	.2	250	2600
5	8	63	12.8	9.5	7.5	2.4	13	5.4	12.9	-	5	62	62	35	*25	21	.1	170	10000
5	15	63	12.2	9.5	8.2	2.7	17	7.2	10.2	-	25	140	142	30	*25	65	.1	275	-
5	22	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7000
5	29	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	800
6	5	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2000
6	13	63	18.3	9.0	8.1	3.7	18	5.6	-	-	-	-	-	-	-	-	-	-	-
6	19	63	21.1	7.6	8.5	1.8	15	5.6	8.7	-	21	-	152	25	35	56	.1	280	-
6	26	63	18.0	7.7	8.2	1.7	16	6.7	12.9	-	14	100	110	15	29	41	.1	220	9000
7	3	63	21.1	8.7	8.2	2.1	18	5.8	-	-	23	128	144	20	28	49	.1	280	900
7	10	63	19.4	7.5	8.2	2.0	19	4.3	7.6	-	26	132	146	30	36	51	.1	320	900
											23	135	149	35	28	52	.1	325	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN CENTRAL SNAKE RIVER

STATION LOCATION SNAKE RIVER AT PAYETTE, IDAHO

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DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	17	63	21.1	7.0	8.1	2.2	20	4.5	9.5	-	26	142	156	25	27	52	.1	330	-
7	24	63	22.2	7.3	8.2	1.8	21	5.6	9.8	-	24	142	160	30	*25	74	.1	340	9000
7	31	63	21.1	6.4	8.2	3.6	17	4.1	7.7	-	24	156	170	30	25	77	.1	350	10000
8	14	63	23.3	6.5	8.0	1.2	19	4.4	-	-	31	162	144	10	57	71	.1	340	-
8	21	63	19.4	6.8	8.1	4.3	22	5.8	8.6	-	19	138	106	15	*25	47	.2	330	850
8	28	63	20.0	7.8	8.5	5.1	28	4.7	10.1	-	28	164	130	25	35	72	.3	340	-
9	4	63	16.7	7.2	8.3	3.0	26	4.9	9.8	-	31	160	[illegible]	20	*25	54	.1	350	4500
9	11	63	18.3	7.4	8.1	4.1	58	7.5	12.2	-	30	158	130	15	28	76	.1	350	6800
9	18	63	16.7	8.7	8.0	3.8	19	8.0	14.4	-	28	152	122	10	*25	67	.2	330	2300
9	25	63	-	8.2	8.1	1.7	22	4.5	14.6	-	30	166	134	15	*25	73	.1	370	1000

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Weiser, Idaho
Operated by U.S. Geological Survey

STATE: Idaho

MAJOR BASIN: Pacific Northwest

MINOR BASIN: Central Snake River

STATION LOCATION: Snake River at Payette, Idaho

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	14.900	14.600	14.300	12.400	19.000	13.500	12.300	14.100	26.600	18.700	9.850	11.700
2	14.600	14.800	15.200	12.800	45.700	14.000	11.600	14.600	26.100	14.600	9.620	12.400
3	15.000	14.900	18.900	14.100	49.000	13.200	11.300	15.000	25.900	12.600	9.780	12.500
4	15.000	17.100	17.800	13.100	41.400	12.100	11.200	16.400	29.100	11.400	10.100	12.500
5	15.100	13.300	16.200	12.200	29.300	11.900	11.200	17.200	30.900	10.400	10.200	12.500
6	15.000	10.400	16.200	12.800	25.100	13.400	13.600	17.400	32.800	10.500	10.200	12.400
7	14.700	11.600	15.900	12.600	21.800	13.600	21.100	17.400	31.400	9.920	10.400	12.300
8	13.500	13.100	15.000	12.800	19.000	13.800	22.200	17.300	32.400	9.550	10.300	12.500
9	14.000	13.500	14.700	12.600	16.400	14.200	20.300	16.200	35.100	9.400	10.300	12.700
10	15.300	13.400	14.200	13.000	16.400	14.100	18.600	16.600	36.200	9.620	10.700	12.800
11	16.900	14.600	13.800	12.100	15.700	13.800	19.200	16.100	38.000	10.300	10.800	12.700
12	16.000	14.000	13.300	9.300	13.000	12.400	17.600	15.100	37.400	9.400	11.000	12.300
13	17.500	13.100	12.900	8.800	15.300	13.800	18.200	15.200	37.500	9.480	10.200	12.200
14	20.800	13.600	13.400	12.000	15.200	13.600	17.200	15.700	36.800	9.300	10.600	11.900
15	21.800	12.800	13.400	12.800	14.600	13.700	18.400	20.600	38.300	9.550	11.300	12.700
16	18.700	13.000	13.500	13.500	14.400	12.800	19.300	24.200	39.600	9.400	10.500	12.800
17	16.600	12.800	14.500	14.200	13.600	12.600	17.800	24.700	37.400	9.400	10.600	13.100
18	16.200	13.400	16.400	15.400	14.100	13.000	17.800	24.200	37.500	9.200	10.600	13.700
19	16.600	13.100	16.200	13.000	14.000	12.600	18.400	22.200	39.200	9.400	10.000	13.600
20	15.900	12.600	15.100	12.200	13.900	12.000	18.100	22.800	38.700	9.550	10.600	15.200
21	16.000	13.900	14.900	12.900	15.100	11.800	16.600	20.000	36.200	9.980	10.300	14.200
22	16.000	15.400	14.600	14.100	14.500	11.900	14.400	22.800	36.900	9.780	10.000	14.500
23	16.200	15.600	13.800	13.800	14.200	12.200	15.000	22.100	39.300	9.700	10.000	14.200
24	16.000	13.800	13.000	13.700	14.000	11.900	14.300	22.400	39.300	9.620	10.100	13.400
25	15.900	13.600	12.900	13.300	13.600	11.500	13.300	23.200	35.800	9.550	10.500	13.100
26	15.600	13.800	13.100	13.400	13.200	11.300	14.500	25.400	30.900	9.620	11.100	13.200
27	15.700	15.600	13.300	12.900	13.500	11.000	14.400	24.400	25.700	9.850	10.900	13.200
28	15.600	17.000	13.800	13.000	13.500	11.400	14.200	24.200	24.000	9.700	11.100	12.900
29	14.900	15.600	13.600	12.300		14.500	13.400	25.000	21.600	9.550	10.300	12.800
30	14.700	15.300	13.000	12.300		13.200	14.700	25.100	19.900	9.400	11.000	13.200
31	14.500		12.600	13.000		12.400		26.400		10.100	11.100	

SPOKANE RIVER AT POST FALLS DAM, IDAHO

This station is located in the Post Falls Dam powerhouse two miles upstream from the Washington-Idaho State line and seven miles downstream from Coeur d'Alene, Idaho. This city draws its municipal water supply from Coeur d'Alene Lake and returns its treated sewage, having a BOD population equivalent of 1500 to the river above the sampling station. Lumbering is the principal industry in this area.

The lower reach of the Spokane River is in pool above Grand Coulee Dam after flowing through Spokane, Washington.

Station Location: Spokane River at Post Falls Dam, Idaho

Major Basin: Pacific Northwest

Minor Basin: Spokane River

Station at: 47°42' Latitude 116°58' Longitude

Miles above mouth: 98

Activation Date: May 14, 1962

Sampled by: Washington Water Power Company

Field Analysis by: U.S. Public Health Service

Other Cooperating Agencies: Washington State Department of Health
Idaho State Department of Health

Hydrologic Data:

Nearest pertinent gaging station: Near Post Falls, Idaho

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 3,840 square miles of which 122 are non-contributing

Period of record: 1912 to present

Average discharge in record period: 6,224 cfs. river only

Maximum discharge in record period: 50,100 cfs.

Minimum discharge in record period: 104 cfs.

Remarks: Some irrigation diversion around station. Flow regulated by Post Falls Dam and influenced by Coeur d'Alene Lake.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.15	.15
	Na	2.0	1.9
	K	1.1	.5
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	330	108
	Cd	1	*2
	As	*4	*11
	B	7	6
	P	29	*6
	Fe	132	3
	Mo	*1	*6
	Mn	.4	*1.2
	Al	—	*6
	Be	*.01	*.03
	Cu	12	17
	Ag	*.1	*.3
	Ni	*1	1
	Co	*1	*2
	Pb	*2	*3
	Cr	*1	*3
	V	*1	6
	Ba	18	28
	Sr	11	7

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	.8	.2	April to June	—	—
January to March	—	—	July to September	1.2	.3

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN SPOKANE RIVER

STATION LOCATION SPOKANE RIVER AT POST FALLS DAM, IDAHO

DATE SAMPLE TAKEN			DATE OF DETERMINATION		RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON					
					ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	1	62	12	14	0	0	0	0	0	0	3	5	6	6	9	8						
10	8	62	11	28	0	0	0	0	0	0	8	5	0	5	8	7						
10	15	62	11	7	0	1	0	1	0	1	17	6	13	5	30	8						
10	22	62	11	3	0	0	0	0	0	0	6	2	1	2	7	3						
10	29	62	11	26	0	0	0	0	0	0	8	3	0	3	8	4						
11	5	62	12	4	0	0	0	0	0	0	10	6	11	6	21	8						
11	13	62	12	28	0	1	0	1	0	1	12	6	11	6	23	8						
11	19	62	12	6	0	0	0	0	0	0	14	6	9	5	23	8						
11	26	62	12	28	0	0	0	0	0	0	12	6	16	6	28	8						
12	3	62	12	[illegible]	0	0	1	0	1	0	18	6	20	6	38	8						
12	10	62	1	7	0	0	0	0	0	0	5	4	6	3	11	5						
12	17	62	1	15	0	0	0	0	0	0	1	6	9	6	10	8						
12	24	62	1	14	0	0	0	0	0	0	7	3	11	3	18	4						
12	31	62	1	16	0	0	0	0	0	0	5	6	16	6	21	8						
1	7	63	1	21	0	0	0	0	0	0	4	3	13	3	17	4						
1	14	63	1	25	0	0	0	0	0	0	10	6	24	6	34	8						
1	21	63	2	5	0	0	0	0	0	0	16	6	12	6	28	8						
1	28	63	2	18	0	0	0	0	0	0	8	3	10	3	18	4						
2	4	63	2	25	0	1	0	1	0	1	20	4	23	4	43	6						
2	11	63	3	8	0	1	0	1	0	1	6	7	16	7	22	9						
2	18	63	3	7	0	0	0	0	0	0	17	6	17	6	34	8						
2	25	63	3	18	0	0	0	0	0	0	5	3	13	3	18	4						
3	4	63	3	28	0	0	0	0	0	0	3	5	10	4	13	6						
3	11	63	3	28	0	1	0	0	0	1	5	5	15	5	20	7						
3	18	63	4	8	0	1	0	0	0	1	10	5	15	5	25	7						
3	25	63	4	10	1	1	0	0	1	1	13	6	15	6	28	8						
4	29	63	6	3*	0	1	0	1	1	1	7	3	14	3	21	4						
5	27	63	7	1*	1	1	0	0	1	1	15	3	14	3	29	4						
6	24	63	8	6*	0	1	0	0	0	1	0	6	6	6	6	8						
7	29	63	8	23*	0	0	0	0	0	0	7	6	10	6	17	8						
8	26	63	10	10*	0	0	0	0	0	0	0	5	6	6	6	8						
9	30	63	11	20*	0	1	0	1	0	1	3	4	9	5	12	6						

PLANKTON POPULATION

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN SPOKANE RIVER

STATION LOCATION SPOKANE RIVER AT POST FALLS DAM, IDAHO

DATE OF SAMPLE			ALGAE (Number per milliliter)										INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																			
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS					1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COL RT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	900	10	20	60	0	0	40	20	790	20	230	84	1	93	1																
10	15	62	1800	0	0	40	0	60	80	170	1450	410	1240	77	3	93	2	69	1														
11	5	62	400	0	0	0	0	0	0	50	380	20	50	87	2																		
11	19	62	1000	0	0	0	0	40	0	170	810	0	120	87	2	77	1	69	1														
12	3	62	200	0	0	0	0	0	0	20	170	0	90																				
12	17	62	200	20	0	0	0	20	0	30	140	20	50																				
1	7	63	200	0	0	0	0	0	0	60	120	30	50																				
1	21	63	100	0	10	0	0	0	0	10	70	30	10																				
2	4	63	100	0	20	0	0	0	0	40	60	60	270																				
2	18	63	200	0	0	0	0	0	50	80	90	60	20																				
3	4	63	200	0	0	0	0	0	20	140	90	30	50																				
3	18	63	900	0	60	0	0	20	80	380	320	40	110	68	2	77	1																
4	1	63	1300	0	0	20	0	0	150	480	610	60	110	77	2	69	2																
4	15	63	1100	0	0	0	70	0	20	810	220	40	130	69	3																		
5	6	63	1800	0	0	20	20	40	40	1050	690	80	0	69	3	77	2																
5	20	63	2700	0	0	20	0	0	80	1090	1530	60	230	77	3	69	3																
6	3	63	500	0	0	0	0	0	0	130	400	110	290	77	2																		
6	17	63	2300	0	20	340	0	90	0	1180	680	270	140	71	3	77	2	26	1	69	1												
8	5	63	200	0	0	20	0	0	0	150	40	60	20																				
8	19	63	600	0	0	110	0	20	70	40	290	40	40	88	1																		
9	3	63	500	0	0	50	0	0	0	0	410	20	90	84	1	77	1																
9	16	63	600	20	0	70	160	70	0	20	230	50	0	77	1	50	1																

PLANKTON POPULATION

STATE IDAHO
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN SPOKANE RIVER
STATION LOCATION SPOKANE RIVER AT POST FALLS DAM, IDAHO

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml.)	MICROINVERTEBRATES																											
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) (Number per ml.)	ROTIFERS														CRUSTACEA										NEMATODES (Identifiable) (Number per liter)	OTHER ANIMAL FORMS (Number per liter)
											OTHER SPECIES PERCENT		NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)												NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)											
														1ST		2ND		3RD		4TH		5TH				1ST		2ND		3RD								
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL			GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL									
10	1	62	47	38	95	26	9	15	45	4	17	-	-	1										2												0	0
10	15	62	95	81	47	9	9	3	92	3	4	-	-	3										3	76	1										0	0
11	5	62	95	87	9	9	56	3	71	1		-	-	4										4	76	1										0	0
11	19	62	95	82	9	3	56	2	46	2	11	-	-	3										1												0	0
12	3	62	95	79	92	7	57	5	9	4	5	20	0	1										2												0	0
12	17	62	95	44	9	21	56	10	57	10	15	-	-	2										0												0	0
1	7	63	57	31	9	27	95	15	2	5	22	-	-	0										4	51	1										0	0
1	21	63	9	40	57	30	82	8	95	6	16	60	0	0										1												0	0
2	4	63	9	34	57	33	95	7	92	6	20	-	-	0										1												0	0
2	18	63	9	43	57	33	56	13	2	2	9	-	-	0										1												0	0
3	4	63	62	22	95	20	9	12	92	5	41	-	-	1										2												0	0
3	18	63	61	66	9	28	95	2	46	2	2	-	-	0										2												0	0
4	1	63	9	39	56	32	57	20	91	2	7	-	-	0										4												0	0
4	15	63	61	77	9	19					4	-	-	0										0												0	0
5	6	63	61	77	9	21	89	1			1	-	-	-										-												-	-
5	20	63	61	54	9	33	82	5	56	2	6	-	-	-										-												-	-
6	3	63	9	35	61	29	56	7	95	5	24	-	-	-										-												-	-
6	17	63	27	37	9	22	82	21	91	4	16	-	-	-										-												-	-
8	5	63										-	-	-										-												-	-
8	19	63	47	86	95	5	9	3	70	1	5	-	-	-										-												-	-
9	3	63										-	-	-										-												-	-
9	16	63										-	-	-										-												-	-

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN SPOKANE RIVER

STATION LOCATION SPOKANE RIVER AT POST FALLS DAM, IDAHO

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	29	62	11	6	5000	141	46	95	2	11	10	1	1	8	0	5	5	1	12
12	3	62	12	11	5000	139	35	104	1	8	10	1	1	8	0	5	3	0	8
1	2	63	1	10	5000	134	53	81	2	17	9	0	1	8	0	5	7	1	12
1	31	63	2	8	5000	127	40	87	1	13	11	3	2	6	0	4	3	1	7
2	27	63	3	8	5000	144	42	102	1	14	9	1	1	7	0	5	3	1	9
3	26	63	4	4	5000	148	49	99	3	15	10	1	1	7	1	5	4	1	11
4	23	63	5	2	5000	98	43	55	2	13	11	2	2	7	0	4	4	0	9
5	28	63	6	5	5000	98	33	65	6	5	8	1	1	6	0	5	3	0	6
6	25	63	7	3	5000	126	50	76	6	14	9	0	1	8	0	4	6	1	10
7	25	63	8	2	5000	146	55	91	3	17	10	1	1	7	1	5	7	1	12
8	28	63	9	5	5000	149	62	87	3	14	12	1	1	9	1	6	7	1	19
9	25	63	10	4	5000	154	67	87	6	19	12	1	1	9	1	6	7	1	16

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE IDAHO
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN SPOKANE RIVER
STATION LOCATION SPOKANE RIVER AT POST FALLS DAM, IDAHO

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	1	62	–	–	7.8	–	–	–	–	–	5	18	28	0	*25	7	.0	40	–
10	8	62	–	–	7.4	–	–	–	–	–	3	24	32	5	*25	7	.0	54	–
10	15	62	–	–	7.1	–	–	–	–	–	3	20	28	10	*25	9	.0	40	–
10	22	62	–	–	7.4	–	–	–	–	–	2	20	24	5	*25	7	.0	58	–
10	29	62	–	–	7.7	–	–	–	–	–	4	20	36	0	*25	8	.0	34	–
11	5	62	–	–	7.5	–	–	–	–	–	2	20	24	0	*25	5	.0	44	–
11	13	62	–	–	7.7	–	–	–	–	–	3	20	40	0	*25	8	.0	42	–
11	19	62	–	–	7.5	–	–	–	–	–	4	22	32	0	*25	9	.2	66	–
12	3	62	–	–	7.8	–	–	–	–	–	4	22	48	0	*25	8	.0	48	–
12	10	62	–	–	7.5	–	–	–	–	–	9	22	28	0	*25	10	.0	–	–
12	17	62	–	–	7.6	–	–	–	–	–	5	22	32	0	*25	9	.0	43	–
12	24	62	–	–	7.5	–	–	–	–	–	2	22	32	0	*25	9	.0	60	–
12	31	62	–	–	7.7	–	–	–	–	–	6	22	40	–	*25	10	.0	40	–
1	7	63	–	–	8.0	–	–	–	–	–	2	20	36	–	*25	20	.0	55	–
1	14	63	–	–	7.5	–	–	–	–	–	3	20	28	–	*25	10	.0	45	–
1	21	63	–	–	7.4	–	–	–	–	–	4	20	44	–	*25	9	.0	95	–
1	28	63	–	–	7.6	–	–	–	–	–	–	18	36	–	*25	11	.0	97	–
2	4	63	–	–	7.7	–	–	–	–	–	2	20	32	5	*25	9	.0	60	–
2	11	63	–	–	7.7	–	–	–	–	–	2	20	36	5	*25	9	.0	60	–
2	18	63	–	–	7.4	–	–	–	–	–	2	20	24	0	*25	6	.0	30	–
2	25	63	–	–	7.4	–	–	–	–	–	2	20	32	0	*25	7	.0	50	–
3	4	63	–	–	7.2	–	–	–	–	–	3	18	44	5	*25	6	.0	35	–
3	11	63	–	–	8.2	–	–	–	–	–	3	18	44	0	*25	7	.0	43	–
3	18	63	–	–	6.8	–	–	–	–	–	1	20	28	0	*25	6	.0	56	–
3	25	63	–	–	7.1	–	–	–	–	–	3	20	32	0	*25	7	.0	55	–
4	1	63	–	–	7.2	–	–	–	–	–	4	20	28	0	*25	7	.0	32	–
4	8	63	–	–	7.8	–	–	–	–	–	7	20	28	0	*25	7	.0	31	–
4	15	63	–	–	7.4	–	–	–	–	–	2	20	28	0	*25	8	.0	29	–
4	29	63	–	–	–	–	–	–	–	–	3	24	32	0	*25	7	.0	34	–
5	6	63	–	–	–	–	–	–	–	–	4	24	36	0	*25	7	.0	39	–
5	13	63	–	–	–	–	–	–	–	–	4	24	36	0	*25	6	.0	43	–
5	20	63	–	–	–	–	–	–	–	–	4	24	28	0	*25	7	.0	56	–
5	27	63	–	–	–	–	–	–	–	–	4	24	40	5	*25	7	.0	43	–
6	3	63	–	–	–	–	–	–	–	–	2	20	44	0	*25	6	.0	26	–
6	10	63	–	–	–	–	–	–	–	–	4	18	24	0	*25	5	.0	36	–
6	17	63	–	–	–	–	–	–	–	–	4	16	28	0	*25	5	.0	56	–
6	24	63	–	–	–	–	–	–	–	–	4	18	28	5	*25	7	.0	57	–
7	1	63	–	–	–	–	–	–	–	–	3	20	36	0	*25	4	.0	36	–
7	8	63	–	–	–	–	–	–	–	–	4	26	40	0	*25	6	.0	71	–

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE IDAHO

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN SPOKANE RIVER

STATION LOCATION SPOKANE RIVER AT POST FALLS DAM, IDAHO

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DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	15	63	-	-	-	-	-	-	-	-	3	16	28	0	*25	11	.0	31	-
7	22	63	-	-	-	-	-	-	-	-	3	20	32	0	*25	7	.0	39	-
7	29	63	-	-	-	-	-	-	-	-	5	18	26	5	*25	7	.0	41	-
8	5	63	-	-	-	-	-	-	-	-	4	20	24	5	*25	7	.0	41	-
8	12	63	-	-	-	-	-	-	-	-	4	20	26	0	*25	7	.0	47	-
8	19	63	-	-	-	-	-	-	-	-	5	22	24	0	*25	7	.0	49	-
8	26	63	-	-	-	-	-	-	-	-	9	20	30	5	*25	8	.0	64	-
9	3	63	-	-	-	-	-	-	-	-	5	20	28	5	*25	8	.0	65	-
9	9	63	-	-	-	-	-	-	-	-	2	20	28	0	*25	8	.0	37	-
9	16	63	-	-	-	-	-	-	-	-	2	22	26	0	*25	7	.0	47	-
9	23	63	-	-	-	-	-	-	-	-	2	24	26	0	*25	7	.0	42	-
9	30	63	-	-	-	-	-	-	-	-	2	24	26	0	*25	7	.0	48	-

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station near Post Falls, Idaho
Data Supplied by U.S. Geological Survey

STATE Idaho

MAJOR BASIN Pacific Northwest

MINOR BASIN Spokane River

STATION LOCATION Spokane River at Post Falls Dam, Idaho

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	.800	1.400	6.500	5.700	3.800	10.500	11.600	11.300	3.100	1.600	.200	.200
2	.800	1.400	5.900	6.400	3.700	10.500	12.100	11.600	3.100	1.300	.200	.200
3	.800	1.400	7.000	7.500	1.900	10.400	12.200	11.700	2.900	2.100	.200	.200
4	.800	1.400	5.100	8.500	5.100	10.200	12.200	11.600	2.700	1.500	.200	.300
5	.600	1.400	4.900	8.800	7.300	10.000	12.200	11.500	2.900	1.900	.200	.200
6	.500	1.400	4.500	8.600	8.600	9.700	12.200	11.400	4.800	.500	.200	.200
7	.500	1.000	4.700	6.300	10.400	9.300	12.600	11.600	4.600	.500	.200	.200
8	1.400	.800	5.000	3.700	11.700	9.000	13.200	11.700	4.300	.800	.200	.200
9	2.200	1.400	5.000	5.100	12.600	8.600	13.500	11.900	4.300	.800	.200	.200
10	2.000	1.400	5.400	5.100	12.900	8.200	13.700	12.100	4.300	1.500	.200	.200
11	2.800	1.800	5.500	4.600	13.000	7.700	13.700	12.100	6.500	2.600	.200	.200
12	3.100	2.000	4.900	4.700	12.700	7.700	13.500	12.100	4.500	11.000	.200	.200
13	3.100	2.000	4.900	4.700	12.200	6.300	13.300	12.000	3.600	.900	.200	.200
14	4.500	2.000	4.900	4.500	11.900	6.300	13.200	11.900	3.100	1.100	1.100	.200
15	3.300	2.400	5.900	3.900	11.600	6.200	13.100	11.700	3.000	1.000	.300	.200
16	2.700	2.600	6.000	4.500	11.300	5.300	13.200	11.600	3.000	.900	.200	.200
17	2.000	2.400	7.400	3.000	11.000	6.000	13.100	11.400	3.400	.900	.200	.800
18	1.800	2.400	9.300	4.700	10.600	5.800	13.000	11.400	3.000	.900	.200	.400
19	1.400	2.600	10.900	4.600	10.500	5.700	12.700	11.400	3.000	.900	.200	.200
20	1.400	2.400	10.700	4.600	10.600	5.600	12.400	11.400	3.200	.800	.200	.600
21	1.700	5.500	9.900	5.000	10.700	5.500	12.100	11.400	2.500	.700	.200	.700
22	1.600	6.600	9.500	4.800	10.600	5.400	11.900	11.500	1.900	.700	.200	.700
23	1.400	4.400	8.400	4.800	10.500	5.400	11.900	11.600	1.400	.800	.200	1.200
24	1.400	3.500	7.600	4.800	10.300	5.400	11.700	11.600	1.700	.700	.200	.600
25	1.400	4.200	7.400	4.000	10.100	5.500	11.700	11.600	2.200	.700	.200	.600
26	1.400	5.800	5.000	3.900	10.100	3.700	11.600	11.500	2.200	.200	.200	.700
27	1.400	14.900	5.000	3.900	10.300	3.200	11.500	11.600	1.900	.200	.200	.700
28	1.400	7.800	5.500	3.900	10.600	4.200	11.300	11.000	1.900	.200	.200	.700
29	1.400	6.900	5.700	3.900		7.100	11.300	4.200	1.900	.700	.200	.700
30	1.400	9.700	5.700	3.300		8.200	11.300	3.200	1.900	.700	.200	.700
31	1.400		5.700	3.300		10.500		3.100		.700	.200	

WILLAMETTE RIVER AT PORTLAND, OREGON

This station is located at Swan Island 8 1/2 miles above the confluence of the Willamette River and Columbia River. It is estimated that wastes with a BOD population equivalent of some 180,000 enter the Portland Harbor reach of the Willamette River on which the Surveillance station is located. Two pulp mills are located at Oregon City approximately 18 miles above the station. The largest upstream municipality contributing waste is Salem, Oregon which during the canning season discharges some 250,000 BOD population equivalents to the Willamette River and at other times a load of approximately 70,000 BOD population equivalents. Waste treatment facilities are being expanded and improved at Salem.

Station Location:	Willamette River at Portland, Oregon
Major Basin:	Pacific Northwest
Minor Basin:	Willamette River
Station at:	45°33' Latitude 122°43' Longitude
Miles above mouth:	8.5
Activation Date:	August 13, 1962
Sampled by:	U.S. Public Health Service
Field Analysis by:	U.S. Public Health Service
Other Cooperating Agencies:	Oregon State Sanitary Authority
Hydrologic Data:	
Nearest pertinent gaging station:	At Salem, Oregon
Gaging station operated by:	U.S. Geological Survey
Drainage area at gaging station:	7,280 square miles
Period of record:	1909-1916, 1923 to present
Average discharge in record period:	23,360 cfs.

Maximum discharge in record period: 348,000 cfs.

Minimum discharge in record period: 2,470 cfs.

Remarks: Irrigation diversions above station. Many reservoirs regulate flow; most recent added in 1961, Hills Creek Reservoir. Other reservoirs operational before start of pollution surveillance activities.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.27	.10
	Na	10	4.2
	K	1.4	.5
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	25	12
	Cd	*1	*2
	As	*8	*10
	B	19	6
	P	2	*3
	Fe	103	24
	Mo	*1	3
	Mn	.4	.8
	Al	—	10
	Be	*.02	*.01
	Cu	17	9
	Ag	*.2	*.1
	Ni	*1	1
	Co	*2	*2
	Pb	*2	*2
	Cr	*1	*2
	V	*1	3
	Ba	11	7
	Sr	31	16

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	.6	.2	April to June	.7	.2
January to March	—	—	July to September	—	—

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l
1/21 - 2/1/63	α-conidendrin	
2/13 - 2/21/63	α-conidendrin	
3/6 - 3/13/63	α-conidendrin	
4/3 - 4/15/63	α-conidendrin	
5/1 - 5/16/63	α-conidendrin	
6/5 - 6/13/63	α-conidendrin	
11/7 - 11/18/63	α-conidendrin	

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN WILLAMETTE RIVER

STATION LOCATION WILLAMETTE RIVER AT PORTLAND, OREGON

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DATE SAMPLE TAKEN			DATE OF DETERMINATION		RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON				
					ALPHA						BETA						DATE OF DETERMINATION	GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL			ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO. DAY	pc/g	±	pc/g	±
10	19	62	11	20	0	0	0	0	0	0	6	5	4	5	10	7					
10	31	62	11	20	0	0	0	0	0	0	2	5	7	6	9	7					
11	7	62	11	30	0	0	0	1	0	1	9	7	8	6	17	9					
11	14	62	12	4	0	1	0	0	0	1	15	6	23	7	38	9					
11	21	62	12	18	0	1	0	0	0	1	14	7	16	6	30	9					
11	28	62	12	28	1	1	0	1	1	1	119	10	12	5	131	11					
12	5	62	1	3	1	1	0	1	1	1	24	8	12	6	36	10					
12	12	62	1	4	0	1	0	1	0	1	5	7	8	6	13	9					
12	19	62	1	9	0	1	0	0	0	1	38	7	16	6	54	9					
12	26	62	1	10	0	0	0	0	0	0	3	6	10	6	13	8					
1	2	63	1	18	0	1	0	1	0	1	96	8	85	8	181	11					
1	16	63	2	8	0	0	0	0	0	0	8	5	13	5	21	7					
1	23	63	2	5	0	0	0	0	0	0	8	6	7	6	15	8					
1	30	63	2	18	0	0	0	0	0	0	11	3	12	3	23	4					
2	6	63	2	25	0	0	0	0	0	0	9	4	20	4	29	6					
2	13	63	3	4	0	1	0	1	0	1	27	4	14	3	41	5					
2	20	63	3	7	0	0	0	1	0	1	18	7	18	7	36	10					
2	26	63	3	15	0	1	0	1	0	1	7	5	8	6	15	8					
3	6	63	3	25	1	1	0	1	1	1	47	5	12	3	59	6					
3	13	63	3	28	0	0	1	1	1	1	26	6	9	6	35	8					
3	20	63	4	10	1	1	0	1	1	1	16	6	9	6	25	8					
3	27	63	4	16	0	1	3	1	3	1	8	6	16	6	24	8					
4	24	63	5	31*	0	1	0	0	0	1	22	4	16	4	38	6					
5	29	63	6	25*	0	0	0	1	0	1	0	7	6	6	6	9					
6	19	63	8	6*	0	0	0	0	0	0	2	5	2	6	4	8					
7	31	63	8	23*	0	0	0	1	0	1	4	5	10	6	14	8					
8	28	63	10	14*	0	1	0	1	0	1	3	3	5	3	8	4					
9	24	63	11	20*	0	1	0	0	0	1	6	4	3	5	9	6					

PLANKTON POPULATION

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN WILLAMETTE RIVER

STATION LOCATION WILLAMETTE RIVER AT PORTLAND, OREGON

124

DATE OF SAMPLE			ALGAE (Number per milliliter)								INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS			1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	19	62	300	0	0	10	0	10	0	120	180	0	130																		
11	7	62	100	0	0	20	0	20	0	20	60	0	50																		
11	21	62	1000	0	0	0	0	0	0	120	830	0	40	92	2																
12	19	62	100	0	0	0	0	0	0	20	40	20	210																		
1	16	63	00	0	0	0	0	0	0	0	50	0	90																		
2	6	63	100	0	0	0	0	0	0	0	130	0	200																		
2	20	63	100	0	20	0	0	30	0	20	20	20	30																		
3	6	63	200	0	0	20	0	50	60	20	60	0	30																		
3	13	63	200	0	0	30	0	20	120	50	20	20	60																		
3	20	63	300	0	0	0	0	150	0	0	150	40	110																		
4	1	63	100	0	0	0	0	0	0	20	120	20	110																		
4	17	63	200	0	60	20	0	0	0	110	50	30	80																		
5	8	63	900	0	20	0	0	40	20	440	380	20	170	71	1																
5	16	63	300	20	50	0	20	0	0	110	120	30	120																		
6	5	63	900	0	40	0	0	20	60	440	320	20	130	68	1	71	1	92	1												
6	19	63	1400	0	0	210	0	270	50	480	360	320	70	71	2	77	1	51	1	69	1										
7	31	63	800	0	0	120	0	0	20	310	390	170	370	69	1	77	1														
8	21	63	400	20	0	60	0	20	20	170	120	80	150																		
9	2	63	900	0	0	200	0	50	20	360	250	400	250	69	1																
9	19	63	800	70	0	250	0	50	0	250	180	50	250																		

PLANKTON POPULATION

STATE OREGON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN WILLAMETTE RIVER
STATION LOCATION WILLAMETTE RIVER AT PORTLAND, OREGON

124

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH				PROTOZOA (Identified only) Number per ml.	ROTIFERS										CRUSTACEA								NEMATODES (Identifiable) Number per liter	OTHER ANIMAL FORMS (Number per liter)
															GENERA AND COUNT LEVEL (See text for Codes)											GENERA AND COUNT LEVEL (See text for Codes)									
														NUMBER PER LITER	1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	1ST		2ND		3RD				
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL			
10	19	62	47	22	92	16	56	11	30	8	43	40		2										0							0	0
11	7	62	92	37	47	8	56	7	57	6	42			0										0							0	0
11	21	62	92	32	47	13	36	8	62	7	40			0										0							0	0
12	19	62	92	39	62	11	47	7	51	5	38			0										0							0	0
1	16	63												0										0							0	0
2	6	63	92	35	62	11	47	10	97	7	37			1										0							0	0
2	20	63	92	17	2	14	82	7	64	5	57			0										0							0	0
3	6	63	92	10	2	10	70	7	56	7	66			1										0							0	0
3	13	63	92	20	2	9	16	9	51	8	54			1										0							0	0
3	20	63	82	23	92	12	2	6	56	4	55			0										0							0	0
4	1	63	92	15	56	13	57	11	51	5	56			0										0							0	0
4	17	63	56	15	57	11	92	6	2	6	62			0										0							0	0
5	8	63	92	23	71	11	2	9	51	7	50																							
5	16	63	92	13	9	9	58	7	30	6	65																							
6	5	63	92	42	82	11	9	8	26	8	31																							
6	19	63	82	56	9	15	58	6	92	5	18																							
7	31	63																																
8	21	63																																
9	2	63																																
9	19	63																																

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE OREGON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN WILLAMETTE RIVER

STATION LOCATION WILLAMETTE RIVER AT PORTLAND, OREGON

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DATE OF SAMPLE					GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES									
BEGINNING			END								NEUTRALS							
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLOROFORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	OXYGENATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
1	21	63	2	1	4979	275	147	128	46	22	16	3	2	8	3	28	7	0	28
2	13	63	2	21	5242	126	49	77	9	6	14	4	2	8	0	10	2	1	6
3	6	63	3	13	4900#	141	77	64	6	15	19	4	2	13	0	16	5	1	15
4	3	63	4	15	7770	86	35	51	1	8	12	3	2	7	0	6	3	0	5
5	1	63	5	16	4755#	98	47	51	2	12	15	3	1	9	2	6	3	1	8
6	5	63	6	13	4635	129	65	64	9	17	17	3	2	12	0	8	7	1	6
7	3	63	7	10	4204	130	65	65	4	15	20	2	3	15	0	8	7	1	10
8	7	63	8	13	3759	147	54	93	2	12	20	4	2	13	1	7	5	1	7
9	12	63	9	19	3917	157	69	88	4	17	18	1	2	15	0	8	9	1	12

ESTIMATED

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE OREGON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN WILLAMETTE RIVER
STATION LOCATION WILLAMETTE RIVER AT PORTLAND, OREGON

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	19	62	11.9	8.8	6.7	2.2	-	-	-	-	5	24	32	10	*25	7	.0	85	3800
10	31	62	14.7	6.5	7.1	3.3	-	-	-	-	3	22	40	5	*25	4	.0	65	2400
11	7	62	12.7	5.1	7.5	2.5	-	-	-	-	5	32	32	10	*25	3	.0	61	5000
11	14	62	10.3	8.3	7.8	2.6	21	-	-	.9	6	24	28	10	*25	4	.0	82	7500
11	21	62	-	-	7.3	-	16	2.3	7.7	-	-	-	-	-	-	-	-	-	4000
11	28	62	8.7	12.4	7.0	2.9	22	2.0	6.2	.1	5	22	32	20	*25	3	.0	55	10000
12	5	62	8.0	12.3	7.1	2.3	31	2.7	6.3	.2	6	26	24	5	*25	4	.1	-	4400
12	12	62	7.7	11.7	7.3	2.0	30	2.9	6.1	.2	4	24	56	10	*25	4	.0	75	12000
12	19	62	9.2	11.2	7.9	2.1	17	3.0	6.8	.2	4	26	32	10	*25	5	.0	40	-
12	26	62	7.4	11.3	7.2	2.0	16	3.0	6.0	.3	6	34	40	-	*25	5	.0	55	18000
1	2	63	6.7	12.4	7.4	2.9	24	4.1	8.1	.2	7	30	48	-	-	8	.0	-	1000
1	9	63	5.8	11.1	7.1	3.0	22	3.2	7.9	.2	-	-	-	-	-	-	-	-	4200
1	16	63	2.2	12.2	7.2	3.2	27	3.8	8.6	.3	6	22	40	-	*25	3	.0	75	2600
1	23	63	5.2	-	7.3	4.7	33	4.6	9.2	.3	10	40	60	-	*25	8	.0	120	17000
1	30	63	3.8	11.2	7.3	4.6	29	5.0	-	-	16	28	40	-	*25	9	.0	99	28000
2	6	63	8.5	13.6	7.5	3.2	15	-	-	-	6	30	48	15	*25	7	.0	80	9000
2	13	63	7.5	-	7.3	-	-	-	-	-	10	24	28	10	*25	4	.1	60	6500
2	20	63	9.3	10.7	7.8	1.7	16	2.9	7.1	.6	7	24	36	5	*25	7	.0	88	-
2	26	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3800
2	27	63	10.0	10.6	7.3	1.6	17	2.9	7.2	.7	13	24	40	5	*25	7	.0	95	-
3	6	63	8.7	11.0	6.7	4.9	30	2.4	8.2	.9	2	24	28	10	*25	4	.0	67	14000
3	12	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3000
3	13	63	3.8	9.3	6.8	2.4	18	2.7	7.3	.2	4	28	36	5	*25	6	.0	68	-
3	20	63	9.3	9.6	7.8	2.2	21	3.8	8.3	.5	4	24	32	5	*25	2	.0	47	2600
3	27	63	9.6	9.4	7.4	1.8	17	3.5	7.8	.3	6	20	36	5	*25	5	.0	67	15000
4	3	63	9.2	13.5	7.1	1.5	15	2.2	6.1	.2	6	16	28	10	*25	5	.3	36	11000
4	17	63	10.2	11.6	7.5	.8	12	1.7	3.8	.2	4	24	24	5	*25	4	.0	50	-
4	24	63	9.7	11.4	7.2	1.2	9	2.1	5.0	.1	3	24	36	5	*25	3	.0	41	-
5	1	63	11.4	11.0	7.1	.2	14	2.1	5.4	.2	3	28	28	5	*25	2	.0	38	8700
5	8	63	10.2	13.3	7.3	1.5	12	2.1	4.8	.1	-	-	-	-	-	-	-	-	2300
5	16	63	13.3	9.9	7.3	1.4	12	2.0	-	.1	7	28	28	5	*25	3	.0	56	-
5	22	63	17.2	-	-	1.2	13	2.9	6.2	.2	5	24	28	5	*25	3	.0	67	-
5	29	63	16.4	7.3	-	1.6	17	-	-	.2	4	26	44	10	*25	6	.0	-	2000
6	5	63	17.3	4.7	7.2	2.0	22	3.0	-	.3	6	26	32	10	*25	4	.0	61	2000
6	12	63	15.8	6.4	7.1	1.6	16	2.6	7.2	.4	6	26	32	5	*25	3	.0	57	900
6	19	63	20.7	4.9	6.8	1.5	21	3.3	7.7	.2	9	28	32	10	*25	3	.0	79	5000
6	26	63	19.5	2.6	7.1	1.2	19	3.2	6.9	.2	-	-	-	-	-	-	-	-	1500
7	3	63	17.5	5.1	7.1	1.0	19	-	-	.2	6	30	40	5	*25	2	.0	52	800
7	10	63	16.6	4.6	-	1.0	12	2.7	5.6	.1	6	34	48	5	*25	4	.0	82	180

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE OREGON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN WILLAMETTE RIVER
STATION LOCATION WILLAMETTE RIVER AT PORTLAND, OREGON

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	17	63	18.7	5.3	7.1	1.8	8	2.6	5.4	.0	6	28	32	10	*25	7	.0	41	250
7	24	63	20.2	3.8	–	–	–	–	–	–	6	30	36	5	*25	5	.0	63	1300
7	31	63	20.8	3.4	–	–	–	–	–	–	8	28	38	10	*25	7	.0	61	–
8	7	63	21.1	3.9	–	1.7	–	–	–	–	7	26	32	5	*25	5	.0	59	1100
8	14	63	22.2	2.6	6.9	1.5	18	2.6	5.9	–	7	30	28	5	*25	6	.0	72	–
8	21	63	22.4	1.6	6.7	.8	18	2.5	6.9	–	6	30	34	10	*25	6	.0	72	1400
8	28	63	20.6	3.6	7.1	–	16	2.7	4.4	–	6	30	34	5	*25	8	.0	68	–
9	4	63	20.5	2.7	–	2.8	–	–	–	–	13	30	38	5	*25	7	.0	75	100
9	19	63	19.1	3.4	6.9	1.2	16	2.7	6.4	.3	6	28	30	10	*25	5	.0	68	500
9	25	63	18.0	3.3	–	1.2	17	2.7	6.3	.0	5	32	26	5	*25	5	.0	73	6600

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Salem, Oregon
Data Supplied by U.S. Geological Survey

STATE Oregon

MAJOR BASIN Pacific Northwest

MINOR BASIN Willamette River

STATION LOCATION Willamette River at Portland, Oregon

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	7.720	12.800	67.400	14.300	19.000	24.800	90.400	25.200	11.500	10.300	6.460	5.500
2	7.850	12.000	70.000	13.900	88.000	24.800	67.200	26.400	11.500	10.000	6.460	5.740
3	8.300	11.500	80.000	19.000	95.700	26.600	52.900	32.400	11.200	9.700	6.460	5.740
4	9.350	10.600	83.700	24.000	107.000	25.000	44.900	36.900	10.900	9.400	6.460	6.220
5	10.600	8.750	80.800	21.000	101.000	22.800	47.400	33.800	11.400	9.120	6.460	5.980
6	10.700	9.350	73.600	18.000	80.400	21.000	54.700	61.900	12.000	8.840	6.220	5.500
7	10.700	11.800	70.000	16.600	64.600	19.200	61.400	87.000	12.200	8.560	6.220	5.280
8	14.000	11.600	63.900	15.500	52.600	17.800	56.800	109.000	12.200	8.840	5.980	5.280
9	22.400	12.500	58.400	14.800	44.600	16.400	50.800	107.000	11.900	9.120	5.980	5.280
10	29.000	19.900	54.400	13.700	37.000	15.500	46.300	91.500	11.500	9.400	6.220	5.280
11	32.500	19.900	49.100	13.200	31.400	14.400	42.700	70.500	11.200	9.700	6.220	6.220
12	32.500	20.100	47.100	12.000	25.800	14.300	38.300	56.200	10.200	9.700	6.460	5.980
13	30.600	21.200	43.600	11.000	20.800	14.100	39.100	47.100	9.550	9.700	5.980	5.740
14	26.800	20.800	42.200	11.200	19.200	13.600	42.200	38.800	9.410	9.120	6.220	5.740
15	25.800	20.800	37.200	11.500	18.400	13.400	48.000	32.500	8.990	8.560	5.980	5.980
16	24.300	21.900	43.800	11.300	17.000	13.900	52.900	31.200	8.840	8.280	5.980	6.960
17	24.600	22.400	42.200	10.900	16.200	14.400	55.600	28.300	8.560	8.000	5.740	10.900
18	22.800	22.100	39.400	10.600	19.500	14.400	54.100	26.200	8.000	7.740	5.740	10.600
19	20.800	22.800	31.200	10.300	46.600	14.400	51.100	26.200	8.000	7.220	5.740	8.560
20	19.400	25.800	27.300	9.950	57.400	13.600	48.500	26.000	7.740	7.220	5.740	7.740
21	19.200	62.800	24.800	9.350	50.300	13.700	46.300	25.500	7.480	7.220	5.980	7.220
22	18.800	58.000	22.200	9.350	40.500	14.300	40.500	23.200	7.740	7.220	5.980	7.220
23	17.200	50.500	19.600	9.050	35.000	14.800	35.300	23.400	10.000	7.220	5.740	7.740
24	16.000	43.500	18.200	8.750	29.800	16.800	31.700	20.700	10.600	6.960	5.980	7.740
25	16.000	42.200	16.600	8.750	25.300	17.800	30.900	18.600	10.600	6.960	6.220	9.400
26	15.700	55.300	16.000	8.450	24.800	16.200	29.800	17.600	10.300	6.960	5.980	9.120
27	15.700	85.600	14.200	8.150	27.800	16.200	28.200	16.000	10.000	6.960	5.980	8.840
28	16.400	84.000	14.100	8.150	26.600	21.200	26.800	15.300	9.400	6.960	5.980	9.120
29	16.400	70.500	14.100	8.300		35.600	25.800	13.700	9.400	6.960	5.740	9.120
30	16.000	60.800	13.700	8.450		70.500	25.600	12.500	10.000	6.700	5.500	9.120
31	14.100		13.700	9.050		96.000		12.000		6.460	5.500	

YAKIMA RIVER AT RICHLAND, WASHINGTON

This Water Pollution Surveillance System station is located at the City pumping station near the terminus of the Yakima River basin. Extensive irrigation in the basin supports an agricultural economy which produces such diversified crops as: fruits; including apples, cherries, pears, etc.; hay and grain crops; vegetables; and such other crops as sugar beets, potatoes, and hops. Over one quarter million acres are irrigated in the Yakima basin. Yakima, the principal upstream community is located some 90 miles above the Surveillance station and discharges approximately 30,800 BOD population equivalents of treated wastes to the Yakima River. Food processing plants, lumber yards, and some manufacturing plants are located in and near the City of Yakima. Food processing plants which operate seasonally generate large quantities of industrial wastes. These wastes are extensively treated by lagooning and by sprinkler application to land areas. During the irrigation season a high percentage of the flow passing the Surveillance station at Richland consists of irrigation return drainage.

736-491 O—64——11

Station Location: Yakima River at Richland, Washington

Major Basin: Pacific Northwest

Minor Basin: Yakima River

Station at: 46°16' Latitude 119°18' Longitude

Miles above mouth: 5

Activation Date: March 29, 1961

Sampled by: City of Richland, Washington

Field Analysis by: Richland Water Department

Other Cooperating Agencies: Washington State Board of Health
Washington Pollution Control Commission

Hydrologic Data:

Nearest pertinent gaging station: at Kiona, Washington

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 5,600 square miles

Period of record: 1896-1915, 1933 to present

Average discharge in record period: 2,752 cfs. 1962 W.Y. only

Maximum discharge in record period: 67,000 cfs.

Minimum discharge in record period: 105 cfs.

Remarks: Diversion for irrigation of approximately 450,000 acres above gaging station. Some irrigation diversion bypasses station. Some regulation by upstream lakes.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.02	.15
	Na	18	12
	K	3.3	2.5
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	7	2
	Cd	*2	*2
	As	*18	*14
	B	19	18
	P	14	11
	Fe	92	3
	Mo	21	4
	Mn	*.4	*1.4
	Al	—	10
	Be	*.05	*.04
	Cu	6	6
	Ag	*.4	*.4
	Ni	*1	*2
	Co	*4	*2
	Pb	18	5
	Cr	*1	*4
	V	*2	18
	Ba	28	15
	Sr	75	63

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	.4	.2	April to June	—	—
January to March	—	—	July to September	1.0	.4

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l
11/1 - 11/20/62	DDT	
6/20 - 7/10/63	Dieldrin	0.004
6/20 - 7/10/63	DDT	0.001
7/30 - 8/21/63	Dieldrin	0.005
7/30 - 8/21/63	DDT	0.004
7/30 - 8/21/63	DDD	0.003
7/30 - 8/21/63	DDE	0.002

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN YAKIMA RIVER

STATION LOCATION YAKIMA RIVER AT RICHLAND, WASHINGTON

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DATE SAMPLE TAKEN			DATE OF DETERMINATION		RADIOACTIVITY IN WATER														RADIOACTIVITY IN PLANKTON					
					ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	1	62	10	26	-	-	-	-	-	-	10	6	0	8	10	10						
10	8	62	11	7	-	-	-	-	-	-	8	6	16	8	24	10						
10	15	62	11	5	0	1	1	2	1	2	11	7	21	10	32	12						
10	22	62	12	3	-	-	-	-	-	-	4	3	15	4	19	4						
10	31	62	11	21	-	-	-	-	-	-	12	6	19	9	31	11						
11	26	62	12	21*	0	0	1	1	1	1	3	6	25	8	28	10						
12	31	62	1	15*	0	1	1	1	1	1	3	6	7	7	10	9						
1	28	63	2	26*	0	0	1	1	1	1	9	6	10	8	19	10						
2	25	63	3	20*	1	1	1	1	2	1	31	7	21	7	52	10						
3	25	63	4	17*	0	1	1	1	1	1	5	6	10	7	15	9						
4	29	63	5	31*	0	1	1	1	1	1	12	4	14	5	26	6						
5	27	63	6	24*	0	1	0	1	0	1	2	3	5	3	7	4						
6	24	63	7	30*	0	1	1	1	1	1	0	14	11	8	11	16						
7	29	63	9	20*	0	1	2	2	2	2	0	5	14	7	14	9						
8	19	63	10	10*	0	0	2	2	2	2	2	6	7	9	9	11						
9	23	63	11	20*	0	1	2	2	2	2	0	4	13	6	13	7						

PLANKTON POPULATION

STATE WASHINGTON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN YAKIMA RIVER
STATION LOCATION YAKIMA RIVER AT RICHLAND, WASHINGTON

DATE OF SAMPLE			ALGAE (Number per milliliter)										INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS					1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	700	0	0	20	0	0	0	60	580	60	660	92	1																		
10	15	62	5000	0	80	80	0	40	40	250	4510	250	1160	92	5	87	2	82	2														
11	5	62	1000	0	70	0	0	0	0	160	740	20	1600	92	2	82	1																
11	19	62	800	0	0	0	0	20	0	0	810	0	770	87	2	82	1																
12	4	62	200	0	0	20	0	20	0	0	140	0	510																				
12	17	62	1400	0	0	20	0	0	0	200	1210	130	1430	92	2	82	1	79	1	87	1												
1	7	63	200	0	0	20	0	0	0	40	180	0	860																				
1	21	63	100	0	0	0	0	0	0	0	130	60	210																				
2	4	63	1500	0	0	20	0	420	0	40	1030	220	3410	51	2	87	1	92	1														
2	18	63	500	0	0	40	0	60	40	170	150	0	570																				
3	4	63	400	0	0	0	0	20	0	20	310	0	1100																				
3	18	63	700	0	0	80	0	40	80	40	400	80	440																				
4	2	63	1300	0	0	0	0	0	0	90	1210	0	1170	87	2	82	2																
4	15	63	2500	0	0	60	0	20	40	230	2120	150	1490	87	3	82	3																
5	6	63	900	0	0	0	0	20	0	150	700	20	1280	82	2																		
5	20	63	300	0	0	20	0	0	0	130	180	0	420																				
6	3	63	600	0	0	40	0	0	0	180	420	70	1940																				
6	17	63	8700	150	0	1500	0	900	0	5150	970	990	2600	68	5	71	4	26	2	51	2	52	2	92	2	38	1	79	1	3	1		
8	6	63	12000	150	130	1850	0	440	0	7280	2110	370	810																				
8	19	63	3600	20	80	640	0	0	20	2280	600	120	620																				
9	23	63	1600	110	20	340	0	160	0	430	450	160	610	38	1																		

PLANKTON POPULATION

STATE WASHINGTON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN YAKIMA RIVER
STATION LOCATION YAKIMA RIVER AT
RICHLAND, WASHINGTON 089

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml.)	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH				PROTOZOA (Identify/cc) Number per ml.	ROTIFERS										CRUSTACEA								NEMATODES (Identify/cc) Number per liter	OTHER ANIMAL FORMS (Number per liter)
															GENERA AND COUNT LEVEL (See text for Codes)										GENERA AND COUNT LEVEL (See text for Codes)									
															1ST		2ND		3RD		4TH		5TH				1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT			NUMBER PER LITER	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	NUMBER PER LITER	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	1	62	92	73	65	8	36	6	62	3	10	-	-	0													0							0	0
10	15	62	92	69	36	8	64	4	65	3	16	-	-	0													0							0	0
11	5	62	92	50	36	25	65	10	15	1	14	-	-	1													0							0	0
11	19	62	65	52	36	19	92	8	64	5	16	-	-	0													0							0	0
12	4	62	92	26	36	20	16	15	2	7	32	50	-	1													0							0	0
12	17	62	92	28	36	21	16	13	64	8	30	-	-	2													0							1	0
1	7	63	92	13	36	11	65	11	16	8	57	-	-	0													0							0	0
1	21	63	38	23	92	8	2	8	36	7	54	130	-	0													0							0	0
2	4	63	92	32	65	17	66	11	36	9	31	-	-	0													0							0	0
2	18	63	65	30	92	12	70	8	36	7	43	-	-	0													0							1	0
3	4	63	92	24	36	16	65	11	71	6	43	-	-	0													2							0	0
3	18	63	65	21	92	15	36	15	82	9	40	-	-	2													0							1	0
4	2	63	65	36	36	25	92	11	66	6	22	-	-	1													0							0	0
4	15	63	65	40	36	34	92	4	16	4	18	-	-	0													-							-	-
5	6	63	36	49	65	10	92	8	66	6	27	-	-	-													-							-	-
5	20	63	67	24	82	19	36	19	64	6	32	-	-	-													-							-	-
6	3	63	80	24	36	17	82	6	14	6	47	-	-	-													-							-	-
6	17	63	92	26	26	15	82	12	16	9	38	-	-	-													-							-	-
8	6	63										-	-	-													-							-	-
8	19	63										-	-	-													-							-	-
9	23	63										-	-	-													-							-	-

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN YAKIMA RIVER

STATION LOCATION YAKIMA RIVER AT RICHLAND, WASHINGTON

DATE OF SAMPLE					GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES									
BEGINNING			END								NEUTRALS							
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLOROFORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	OXYGENATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	9	62	11	1	4780#	70	14	56	0	4	6	1	1	4	0	2	1	0	1
11	1	62	11	20	2850#	178	35	143	1	8	15	2	1	12	0	4	1	1	5
11	20	62	12	11	2800#	131	17	114	0	3	9	2	1	6	0	2	1	0	2
12	11	62	1	23	1780#	276	56	220	-	-	-	-	-	-	-	-	-	-	-
1	25	63	3	18	5710	91	38	53	1	11	13	1	1	10	1	4	3	1	5
3	18	63	4	9	12720	40	12	28	-	-	-	-	-	-	-	-	-	-	-
4	9	63	4	24	4110	112	39	73	1	9	14	2	2	10	0	5	3	1	6
4	24	63	5	13	8660	70	33	37	-	-	-	-	-	-	-	-	-	-	-
5	13	63	5	29	7730	57	17	40	1	4	6	1	1	4	0	2	1	0	3
5	29	63	6	20	8080	61	24	37	-	-	-	-	-	-	-	-	-	-	-
6	20	63	7	10	6700	72	29	43	1	8	8	1	1	6	0	6	2	1	3
7	10	63	7	30	5770	85	25	60	-	-	-	-	-	-	-	-	-	-	-
7	30	63	8	21	6400	68	18	50	1	3	8	1	1	6	0	2	1	1	2
8	21	63	9	17	9980	48	12	36	-	-	-	-	-	-	-	-	-	-	-
9	17	63	10	14	6700	56	17	39	0	5	7	1	1	5	0	2	1	0	2

ESTIMATED

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE WASHINGTON

MAJOR BASIN PACIFIC NORTHWEST

MINOR BASIN YAKIMA RIVER

STATION LOCATION YAKIMA RIVER AT RICHLAND, WASHINGTON

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DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	F.O.B. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	1	62	16.8	8.9	8.3	1.6	-	-	-	-	12	175	140	-	*25	45	-	197	630
10	8	62	13.6	9.8	8.2	2.1	-	-	-	-	10	170	130	-	*25	47	-	211	300
10	15	62	12.4	9.1	7.9	2.1	-	-	-	-	12	150	120	-	*25	50	-	223	3100
10	22	62	14.0	8.5	8.0	2.2	-	-	-	-	10	140	120	-	*25	36	-	231	500
10	29	62	13.2	9.2	8.1	1.4	-	-	-	-	10	140	110	-	*25	27	-	-	300
11	5	62	11.9	9.4	8.1	1.4	-	-	-	-	12	150	120	-	*25	34	-	-	-
11	12	62	-	-	7.9	-	-	-	-	-	10	136	116	0	*25	21	.0	190	-
11	19	62	8.8	10.0	7.9	1.9	-	-	-	.1	8	138	120	0	*25	25	.0	220	30
11	26	62	7.9	9.0	8.0	1.1	-	-	-	-	6	70	72	5	*25	13	.2	130	400
12	4	62	-	-	7.6	-	-	-	-	-	5	86	92	5	*25	16	.0	155	-
12	10	62	6.0	9.9	7.7	1.4	-	-	-	.2	5	76	68	0	*25	11	.0	140	300
12	17	62	7.3	9.4	7.8	1.2	-	-	-	.4	10	90	100	-	30	17	-	141	-
12	24	62	-	-	7.9	-	-	-	-	-	6	74	68	0	*25	13	.2	125	-
12	31	62	-	-	7.9	-	-	-	-	-	6	86	80	-	*25	12	.1	120	-
1	7	63	1.4	10.0	7.9	1.3	-	-	-	.2	10	110	80	-	*25	21	-	157	-
1	14	63	.9	10.2	7.8	1.4	-	-	-	.4	10	100	90	-	*25	23	-	172	300
1	21	63	.4	10.0	7.7	1.3	-	-	-	.4	4	100	60	-	*25	13	.1	120	-
1	28	63	.8	10.1	7.9	1.7	-	-	-	.3	7	100	96	-	*25	15	.1	150	-
2	11	63	4.2	10.4	7.8	2.1	-	-	-	.1	5	68	64	20	*25	11	.4	120	-
2	18	63	5.1	10.8	7.7	2.6	-	-	-	-	6	80	76	10	*25	12	.2	125	-
2	25	63	6.5	12.0	7.9	2.5	-	-	-	.2	3	88	80	5	*25	10	.0	110	-
3	4	63	7.4	12.2	7.8	-	-	-	-	-	4	80	76	5	*25	8	.0	117	50
3	11	63	8.6	11.7	8.0	3.0	-	-	-	-	7	88	100	0	*25	10	.0	137	100
3	18	63	9.1	12.2	8.2	2.6	-	-	-	-	5	100	88	0	*25	10	.0	140	*33
3	25	63	13.0	12.4	8.2	2.8	-	-	-	-	5	104	96	5	*25	16	.0	160	*33
4	2	63	-	-	7.5	-	-	-	-	-	5	84	96	5	*25	12	.3	132	-
4	15	63	-	-	7.2	-	-	-	-	-	5	63	80	5	*25	11	.0	131	-
4	24	63	-	-	7.2	-	-	-	-	-	6	76	84	5	*25	8	.0	129	-
4	29	63	15.4	8.6	8.2	1.1	-	-	-	-	4	84	84	0	*25	10	.0	111	300
5	6	63	-	-	-	-	-	-	-	-	5	92	92	0	*25	12	.1	145	-
5	13	63	-	-	-	-	-	-	-	-	7	88	80	0	*25	11	.1	123	100
5	20	63	-	-	-	-	-	-	-	-	5	88	92	0	*25	15	.0	143	100
5	27	63	-	-	-	-	-	-	-	-	3	58	64	0	*25	8	.0	106	-
6	3	63	-	-	-	-	-	-	-	-	5	76	72	5	*25	12	.0	115	300
6	10	63	-	-	-	-	-	-	-	-	6	124	124	5	*25	21	.0	191	100
6	17	63	-	-	-	-	-	-	-	-	12	146	144	5	*25	24	.0	210	-
6	24	63	-	-	-	-	-	-	-	-	9	152	136	5	*25	29	.0	240	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE WASHINGTON
MAJOR BASIN PACIFIC NORTHWEST
MINOR BASIN YAKIMA RIVER
STATION LOCATION YAKIMA RIVER AT RICHLAND, WASHINGTON

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	2	63	-	-	-	-	-	-	-	-	9	132	136	0	*25	25	•1	210	-
7	15	63	-	-	-	-	-	-	-	-	8	134	128	5	*25	35	•0	210	-
7	29	63	-	-	-	-	-	-	-	-	9	140	126	0	*25	27	•1	190	-
8	6	63	-	-	-	-	-	-	-	-	9	136	124	5	*25	26	•1	190	-
8	19	63	-	-	-	-	-	-	-	-	12	148	128	5	*25	27	•1	230	-
9	23	63	19•5	8•6	8•7	9•8	-	-	-	-	9	156	134	0	*25	27	•2	239	-

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Kiona, Washington
Operated by U.S. Geological Survey

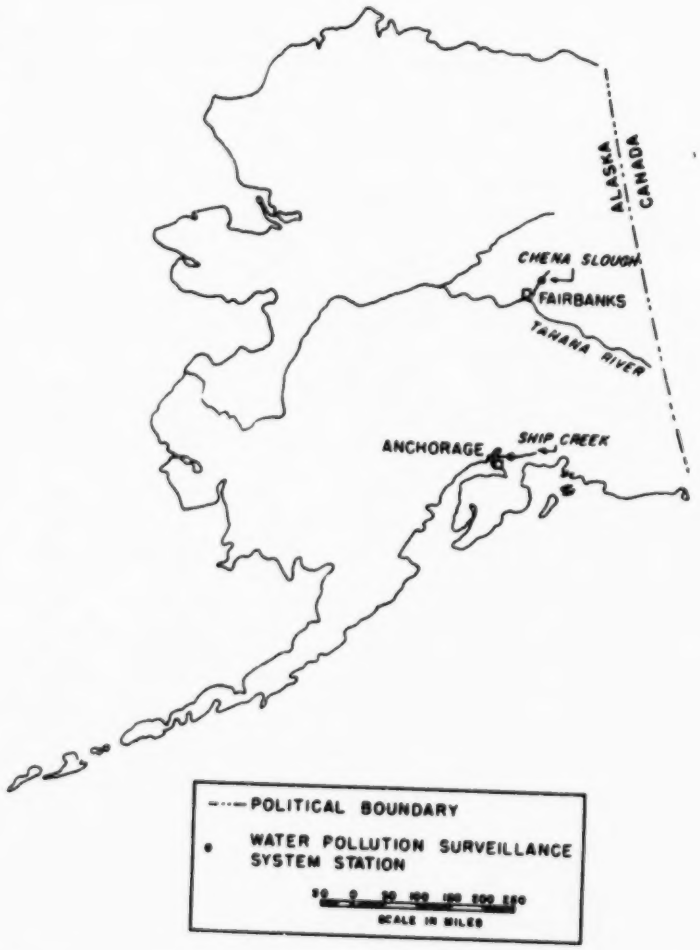
STATE: Washington

MAJOR BASIN: Pacific Northwest

MINOR BASIN: Yakima River

STATION LOCATION: Yakima River at Richland, Washington

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	2.310	2.740	4.910	4.870	1.590	5.170	3.450	3.660	3.930	1.550	1.340	1.650
2	2.560	2.590	5.150	4.910	1.800	5.130	3.300	3.720	3.960	1.460	1.380	1.610
3	2.480	2.530	4.620	4.960	1.880	5.260	3.120	3.620	3.930	1.370	1.450	1.550
4	2.280	2.460	4.380	5.190	8.770	5.060	2.890	3.430	3.200	1.210	1.410	1.540
5	2.190	2.410	4.160	5.580	10.200	4.580	2.910	3.340	3.000	1.200	1.330	1.660
6	2.080	2.320	4.300	5.550	13.300	4.400	3.020	3.280	2.500	1.050	1.400	1.740
7	1.950	2.450	4.480	5.310	12.800	4.160	4.060	3.500	1.880	1.220	1.330	1.720
8	1.860	2.430	5.010	5.110	10.700	3.990	5.220	3.830	1.600	1.490	1.240	1.680
9	1.830	2.410	5.130	4.920	10.400	3.820	5.640	3.900	1.470	1.870	1.190	1.650
10	2.000	2.410	5.280	4.450	9.400	3.590	5.440	3.770	1.450	2.120	1.200	1.640
11	2.130	2.450	5.470	4.210	8.080	3.430	4.990	3.670	1.450	1.840	1.240	1.620
12	2.430	2.440	5.510	3.060	7.360	3.340	4.460	3.540	1.360	1.530	1.320	1.590
13	2.950	2.490	5.440	3.020	6.430	3.370	4.210	3.160	1.180	1.430	1.420	1.580
14	3.120	2.540	5.170	3.070	5.920	3.320	4.330	3.040	.968	1.490	1.520	1.580
15	3.430	2.540	5.220	3.280	5.690	3.160	4.530	2.670	1.160	1.280	1.450	1.570
16	3.380	2.610	5.370	3.720	5.490	3.160	5.170	2.700	1.050	1.350	1.390	1.590
17	4.010	2.350	6.250	3.860	5.190	3.100	5.820	2.670	.896	1.320	1.400	1.760
18	4.160	2.390	6.430	3.780	5.060	3.020	5.710	2.840	.905	1.280	1.410	1.960
19	4.210	2.370	6.470	3.600	4.890	2.850	5.310	2.530	1.260	1.220	1.400	1.910
20	3.780	2.230	6.190	3.360	5.380	2.670	5.060	3.020	.972	1.570	1.410	1.860
21	3.560	2.770	6.000	2.880	5.890	2.590	4.910	4.770	.835	1.330	1.480	1.760
22	3.480	2.820	5.780	2.700	5.620	2.350	5.440	6.680	.783	1.260	1.560	1.610
23	3.340	8.890	5.670	2.590	5.370	2.520	5.490	7.960	1.020	1.270	1.670	1.590
24	3.250	6.530	5.650	3.010	5.190	2.680	5.130	7.940	1.240	1.660	1.740	1.610
25	3.250	5.530	5.350	2.610	4.600	2.710	4.890	7.160	1.480	1.370	1.800	1.740
26	3.160	4.980	4.920	2.590	4.990	2.880	4.650	6.250	1.530	1.380	1.840	1.720
27	3.100	5.730	4.740	2.430	4.820	2.770	4.460	5.370	1.420	1.410	1.810	1.780
28	3.010	6.140	4.720	2.230	5.220	2.850	4.140	5.260	1.280	1.390	1.870	1.740
29	2.950	6.090	4.860	1.980		2.820	3.880	4.010	1.200	1.350	1.800	1.680
30	2.880	5.060	4.870	2.040		3.010	3.670	3.220	1.400	1.320	1.740	1.640
31	2.840		4.820	1.860		3.160		3.640		1.320	1.750	



ALASKA

Alaska embraces over 586,000 square miles with three climatic and hydrologic regions.

The southeastern (panhandle) and southern coastal region has a marine climate with mean temperatures at Ketchikan and Anchorage of 33° and 11° F. in January and 58° and 57° F. in July, respectively. Corresponding precipitation values are 151 inches and 14 inches per year. The Public Health Service Water Pollution Surveillance System station at Anchorage provides data on water quality in the northerly portion of this region.

The interior region is bounded on the south by the Alaska Range with a maximum elevation of 20,300 feet at Mount McKinley and on the north by the Brooks Range with elevations to 8,000 feet. Over 300,000 square miles of the interior drains into the Yukon River which begins within 25 miles of tidewater in southeastern Alaska and runs 2,300 miles to the Bering Sea. The Tanana River is a major tributary to the Yukon. The surveillance station at Fairbanks provides data on a tributary of the Tanana. Mean January and July temperatures at Fairbanks vary from about −12° and 60° F. Annual precipitation is about 12 inches.

The western and northern region includes the Aleutian Islands, the Bering Sea coast, and the Arctic drainage basins. Mean winter and summer temperatures vary from 32° and −17° F. to 51° and 40° F. at Dutch Harbor and Point Barrow, respectively. Corresponding precipitation totals about 57 and 4 inches annually.

CHENA RIVER AT FAIRBANKS, ALASKA

The Public Health Service Water Pollution Surveillance System station at Fairbanks is located at Fort Wainwright on the Chena River some 16 miles above the confluence of the Chena and Tanana Rivers. The Chena River at the sampling point is occasionally referred to as Chena Slough. Municipal and industrial wastes associated with the City of Fairbanks are discharged to the Chena River downstream from the Water Pollution Surveillance System station.

Station Location: Chena River at Fairbanks, Alaska

Major Basin: Alaska

Minor Basin: Yukon River

Station at: 64°51' Latitude 147°36' Longitude

Miles above mouth: 16

Activation Date: June 4, 1962

Sampled by: Fairbanks Municipal Utilities System

Field Analysis by: Fairbanks Municipal Utilities System

Other Cooperating Agencies: Alaska State Department of Health and Welfare
U.S. Army

Hydrologic Data:

Nearest pertinent gaging station: Fairbanks, Alaska

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 1,980 square miles

Period of record: 1947 to date

Average discharge in record period: 1,464 cfs.

Maximum discharge in record period: 24,200 cfs.

Minimum discharge in record period: not determined

Remarks:

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	—	.05
	Na	—	3.4
	K	—	.5
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	*10	*10
	Cd	*5	*2
	As	*47	*10
	B	120	10
	P	*12	*5
	Fe	9	20
	Mo	*9	*3
	Mn	*24	*1
	Al	—	3
	Be	*.12	*.01
	Cu	*5	5
	Ag	*.9	*.1
	Ni	*5	*2
	Co	*9	*2
	Pb	*2	*2
	Cr	*3	*2
	V	*5	*3
	Ba	15	7
	Sr	341	14

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	.3	.2	April to June	.7	.2
January to March	—	—	July to September	—	—

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE ALASKA

MAJOR BASIN ALASKA

MINOR BASIN YUKON RIVER

STATION LOCATION CHENA RIVER AT FAIRBANKS, ALASKA

DATE SAMPLE TAKEN			DATE OF DETERMINATION		RADIOACTIVITY IN WATER												DATE OF DETERMINATION	RADIOACTIVITY IN PLANKTON			
					ALPHA						BETA							GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL			ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO. DAY	pc/g	±	pc/g	±
10	1	62	10	26	0	0	1	1	1	1	2	5	10	7	12	9					
10	8	62	11	28	0	0	0	1	0	1	2	5	7	6	9	8					
10	15	62	11	28	0	1	0	0	0	1	5	5	6	6	11	8					
10	29	62	12	15	0	1	1	1	1	1	2	5	8	7	10	9					
11	5	62	11	28	0	1	1	1	1	1	10	6	21	7	31	9					
5	28	63	6	25*	1	2	0	1	1	2	32	15	38	7	70	17					
6	24	63	8	6*	1	1	0	1	1	1	11	6	14	7	25	9					
7	23	63	9	16*	0	1	0	1	0	1	6	3	10	3	16	4					
8	27	63	10	4*	0	1	0	1	0	1	6	6	14	7	20	9					
9	16	63	11	20*	0	1	0	1	0	1	3	5	6	5	9	7					

PLANKTON POPULATION

STATE ALASKA
MAJOR BASIN ALASKA
MINOR BASIN YUKON RIVER
STATION LOCATION CHENA RIVER AT FAIRBANKS, ALASKA

DATE OF SAMPLE			ALGAE (Number per milliliter)								INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																			
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	100	0	0	10	0	0	0	0	40	10	100																			
10	15	62	500	0	40	0	0	0	0	80	410	0	0	92	1																	
11	5	62	100	0	0	0	0	0	0	20	40	0	0																			
5	6	63	00	0	0	0	0	0	0	0	40	0	350																			
5	21	63	300	0	0	0	0	0	0	0	340	60	190																			
6	4	63	00	0	0	0	0	0	0	0	0	0	0																			
6	18	63	00	0	0	0	0	0	10	10	10	10	40																			
7	16	63	300	0	0	20	0	0	0	0	310	20	150																			
8	6	63	600	0	0	0	0	0	0	0	590	0	490																			
8	19	63	200	0	0	40	0	20	0	0	90	0	220																			
9	3	63	100	0	0	0	0	0	0	0	90	0	130																			
9	17	63	800	560	0	0	0	0	0	0	270	0	110	4	2																	

PLANKTON POPULATION

STATE ALASKA

MAJOR BASIN ALASKA

MINOR BASIN YUKON RIVER

STATION LOCATION CHENA RIVER AT FAIRBANKS, ALASKA

111

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH						ROTIFERS										CRUSTACEA									
															GENERA AND COUNT LEVEL (See text for Codes)										GENERA AND COUNT LEVEL (See text for Codes)							
															1ST		2ND		3RD		4TH		5TH		1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT		PROTOZOA (Identifiable) Number per ml.	NUMBER PER LITER	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	NUMBER PER LITER	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	REMATODES (Identifiable) Number per liter	OTHER ANIMAL FORMS (Number per liter)
10	1	62	92	37	14	14	45	10	35	3	36	-	-	0											0							0	0
10	15	62	92	32	14	22	35	7	2	5	34	-	-	0											0							0	0
11	5	62	92	30	14	10	46	8	2	6	46	-	-	0											0							0	0
5	6	63										-	-	-											-							-	-
5	21	63	35	15	92	12	2	9	36	6	58	-	-	-											-							-	-
6	4	63										-	-	-											-							-	-
6	18	63	14	10	92	9	45	9	31	7	65	-	-	-											-							-	-
7	16	63										-	-	-											-							-	-
8	6	63										-	-	-											-							-	-
8	19	63										-	-	-											-							-	-
9	3	63										-	-	-											-							-	-
9	17	63										-	-	-											-							-	-

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE ALASKA
MAJOR BASIN ALASKA
MINOR BASIN YUKON RIVER
STATION LOCATION CHENA RIVER AT FAIRBANKS, ALASKA

111

DATE OF SAMPLE					GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES										
BEGINNING			END								NEUTRALS								
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLORO-FORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
9	6	63	9	13	4648	140	61	79	2	17	18	4	3	11	0	8	5	1	10

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE ALASKA

MAJOR BASIN ALASKA

MINOR BASIN YUKON RIVER

STATION LOCATION CHENA RIVER AT FAIRBANKS, ALASKA 111

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	1	62	3.0	-	7.0	-	-	-	-	-	2	64	88	20	25	17	.0	95	-
10	8	62	1.5	-	7.5	-	-	-	-	-	4	60	80	15	*25	16	.0	77	-
10	15	62	1.1	-	7.6	-	-	-	-	-	3	64	80	20	*25	20	.0	104	-
10	29	62	1.0	-	8.1	-	-	-	-	-	3	68	88	5	*25	16	.0	109	-
11	5	62	.0	-	7.8	-	-	-	-	-	3	72	88	5	*25	16	.0	110	-
11	13	62	1.0	-	7.9	-	-	-	-	-	2	46	48	0	*25	9	.0	70	-
5	14	63	3.7	-	7.0	-	-	-	-	-	4	24	48	90	*25	5	.0	62	-
5	21	63	7.3	-	6.9	-	-	-	-	-	4	24	36	75	*25	5	.0	61	-
5	28	63	8.2	-	7.0	-	-	-	-	-	3	42	52	15	*25	17	.0	81	-
6	4	63	9.7	-	6.9	-	-	-	-	-	2	56	68	5	*25	17	.0	91	-
6	18	63	9.5	-	6.8	-	-	-	-	-	4	48	72	35	*25	16	.0	102	-
6	25	63	7.0	-	7.1	-	-	-	-	-	5	36	54	60	*25	10	.0	101	-
7	2	63	10.4	-	7.0	-	-	-	-	-	3	48	72	30	*25	15	.0	91	-
7	9	63	13.6	-	6.9	-	-	-	-	-	3	60	68	10	*25	17	.0	96	-
7	16	63	11.2	-	6.9	-	-	-	-	-	3	58	72	15	*25	18	.0	93	-
7	23	63	12.0	-	6.9	-	-	-	-	-	4	56	74	15	*25	20	.0	93	-
8	6	63	8.5	-	6.9	-	-	-	-	-	4	40	58	35	*25	14	.0	85	-
8	13	63	9.0	-	7.1	-	-	-	-	-	4	44	54	35	*25	15	.0	84	-
8	20	63	7.4	-	6.9	-	-	-	-	-	4	46	64	25	*25	17	.0	85	-
8	27	63	8.5	-	7.0	-	-	-	-	-	7	52	66	15	*25	17	.0	95	-
9	3	63	-	-	7.1	-	-	-	-	-	8	60	76	10	*25	19	.0	101	-
9	10	63	7.2	-	7.1	-	-	-	-	-	3	66	72	10	*25	18	.0	95	-
9	17	63	5.6	-	7.0	-	-	-	-	-	2	66	76	5	*25	19	.0	104	-

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Fairbanks, Alaska
Operated by U.S. Geological Survey

STATE Alaska

MAJOR BASIN Alaska

MINOR BASIN Yukon River

STATION LOCATION Chena River at Fairbanks, Alaska

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	2.450	1.700	.549	.143	.342	.342	.416	.356	12.300	3.420	3.420	3.420
2	2.450	1.700	.549	.143	.342	.342	.416	.356	12.300	3.420	3.420	3.420
3	2.450	1.700	.549	.143	.342	.342	.416	.356	12.300	3.420	3.420	3.420
4	2.450	1.700	.549	.143	.342	.342	.416	.356	12.300	3.420	3.420	3.420
5	2.450	1.700	.549	.143	.342	.342	.416	.356	12.300	3.420	3.420	2.460
6	2.450	1.700	.549	.143	.342	.342	.416	.356	12.300	3.420	3.420	2.460
7	2.450	1.700	.549	.143	.342	.342	.416	.356	3.420	3.420	3.420	2.460
8	2.450	1.700	.549	.143	.342	.342	.416	10.800	3.420	3.420	3.420	2.460
9	2.450	1.700	.549	.143	.342	.342	.416	10.800	3.420	3.420	3.420	2.460
10	2.450	.549	.143	.143	.342	.342	.416	10.800	3.420	3.420	3.420	2.460
11	2.450	.549	.143	.143	.342	.342	.416	8.940	3.420	3.420	3.420	2.460
12	2.450	.549	.143	.143	.342	.342	.416	8.940	3.420	3.420	3.420	2.460
13	2.450	.549	.143	.143	.342	.342	.416	8.940	3.420	3.420	3.420	2.460
14	2.450	.549	.143	.143	.342	.416	.416	8.940	3.420	3.420	3.420	2.460
15	2.450	.549	.143	.143	.342	.416	.416	8.940	3.420	3.420	3.420	2.460
16	2.450	.549	.143	.143	.342	.416	.416	8.940	3.420	3.420	3.420	2.460
17	2.450	.549	.143	.143	.342	.416	.416	8.940	3.420	3.420	3.420	2.460
18	2.450	.549	.143	.143	.342	.416	.416	8.940	3.420	3.420	3.420	2.460
19	1.700	.549	.143	.143	.342	.416	.416	12.300	3.420	3.420	3.420	2.460
20	1.700	.549	.143	.143	.342	.416	.416	12.300	3.420	3.420	3.420	2.460
21	1.700	.549	.143	.143	.342	.416	.416	12.300	3.420	3.420	3.420	2.460
22	1.700	.549	.143	.143	.342	.416	.416	12.300	3.420	3.420	3.420	2.460
23	1.700	.549	.143	.143	.342	.416	.356	12.300	3.420	3.420	3.420	2.460
24	1.700	.549	.143	.143	.342	.416	.356	12.300	3.420	3.420	3.420	2.460
25	1.700	.549	.143	.143	.342	.416	.356	12.300	3.420	3.420	3.420	2.460
26	1.700	.549	.143	.143	.342	.416	.356	12.300	3.420	3.420	3.420	2.460
27	1.700	.549	.143	.143	.342	.416	.356	12.300	3.420	3.420	3.420	2.460
28	1.700	.549	.143	.143	.342	.416	.356	12.300	3.420	3.420	3.420	2.460
29	1.700	.549	.143	.143		.416	.356	12.300	3.420	3.420	3.420	2.460
30	1.700	.549	.143	.143		.416	.356	12.300	3.420	3.420	3.420	2.460
31	1.700		.143	.342		.416		12.300		3.420	3.420	

SHIP CREEK AT ANCHORAGE, ALASKA

The Anchorage Surveillance System station is located in the Anchorage water treatment plant and obtains samples from Ship Creek Reservoir. This stream is the municipal supply for Ft. Richardson and Elmendorf Air Force Base, and is part of the supply for Anchorage. The average diversion for this municipal use is 16 cubic feet per second.

Station Location: Ship Creek at Anchorage, Alaska

Major Basin: Alaska

Minor Basin: North Pacific Ocean

Station at: 61°13' Latitude 149°38' Longitude

Miles above mouth: 8

Activation Date: June 4, 1962

Sampled by: Greater Anchorage Health District

Field Analysis by: U.S. Public Health Service

Other Cooperating Agencies: Alaska Department of Health and Welfare

Hydrologic Data:

Nearest pertinent gaging station: near Anchorage, Alaska

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 91 square miles

Period of record: 1946 to present

Average discharge in record period: 162 cfs. W.Y. 1962 only

Maximum discharge in record period: 1,860 cfs.

Minimum discharge in record period: 0

Remarks: Municipal diversion of approximately 16 cfs. for Fort Richardson, Elmendorf Air Force Base and City of Anchorage above gaging station.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.05	.25
	Na	3.0	1.4
	K	.8	.9
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	59	14
	Cd	*1	*2
	As	36	*10
	B	19	10
	P	*2	*3
	Fe	16	2
	Mo	*1	2
	Mn	1.5	.9
	Al	—	2
	Be	*.02	*.02
	Cu	13	9
	Ag	*.2	*.2
	Ni	*1	3
	Co	*2	*2
	Pb	17	2
	Cr	*1	*2
	V	*1	*3
	Ba	12	4
	Sr	122	24

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	.3	.1	April to June	—	—
January to March	—	—	July to September	.9	.2

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE ALASKA

MAJOR BASIN ALASKA

MINOR BASIN NORTH PACIFIC OCEAN

STATION LOCATION SHIP CREEK AT ANCHORAGE, ALASKA

110

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON				
			DATE OF DETERMINATION	ALPHA					BETA						DATE OF DETERMINATION	GROSS ACTIVITY			
				SUSPENDED		DISSOLVED		TOTAL	SUSPENDED		DISSOLVED		TOTAL			ALPHA		BETA	
MO.	DAY	YR.	MO. DAY	pc/l	±	pc/l	±	pc/l ±	pc/l	±	pc/l	±	pc/l	±	MO. DAY	pc/g	±	pc/g	±
10	19	62	11 6	0	0	0	1	0 1	6	6	13	7	19	9					
11	19	62	12 28	0	0	0	0	0 0	0	6	7	6	7	8					
11	30	62	1 11	0	0	1	1	1 1	4	5	5	5	9	7					
12	5	62	1 4	0	0	0	0	0 0	2	6	4	6	6	8					
12	12	62	1 9	0	0	0	0	0 0	0	8	6	7	6	11					
12	19	62	1 11	0	0	0	1	0 1	7	5	8	5	15	7					
12	27	62	1 30	0	0	0	0	0 0	4	7	6	7	10	10					
1	4	63	2 8	-	-	-	-	- -	1	5	3	6	4	8					
1	11	63	1 25	0	0	0	0	0 0	0	6	9	6	9	8					
1	17	63	2 1	0	0	0	0	0 0	1	5	10	6	11	8					
1	24	63	2 14	0	0	0	0	0 0	27	6	20	7	47	9					
2	1	63	3 4	0	0	0	1	0 1	4	3	9	3	13	4					
2	7	63	2 25	0	0	0	1	0 1	2	3	7	4	9	5					
2	14	63	3 11	0	1	0	1	0 1	2	3	9	3	11	4					
3	8	63	4 1	0	0	1	1	1 1	16	3	63	4	79	5					
3	14	63	3 28	0	0	0	0	0 0	3	5	8	5	11	7					
3	28	63	4 18	0	0	0	0	0 0	4	6	6	7	10	9					
4	29	63	6 3*	0	1	0	1	0 1	13	3	33	4	46	5					
5	27	63	6 25*	0	1	0	1	0 1	13	7	22	6	35	9					
6	24	63	8 6*	0	0	0	1	0 1	0	9	13	6	13	11					
7	29	63	8 27*	0	0	0	0	0 0	2	6	8	6	10	8					
8	26	63	10 4*	0	1	0	1	0 1	4	6	7	6	11	8					
9	30	63	11 20*	0	0	0	1	0 1	2	4	10	6	12	7					

PLANKTON POPULATION

STATE ALASKA
MAJOR BASIN ALASKA
MINOR BASIN NORTH PACIFIC OCEAN
STATION LOCATION SHIP CREEK AT
ANCHORAGE, ALASKA 110

DATE OF SAMPLE			ALGAE (Number per milliliter)										INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS					1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	19	62	00	0	0	0	0	0	0	0	40	0	0																			
11	5	62	100	0	0	0	0	0	0	20	40	0	0																			
11	19	62	00	0	0	0	0	0	0	0	30	0	50																			
12	5	62	100	0	0	0	0	0	0	0	80	0	0																			
4	18	63	100	0	40	0	0	0	30	0	10	10	10																			
4	29	63	00	0	0	0	0	0	0	0	40	0	30																			
5	27	63	00	0	0	0	0	0	0	0	0	0	80																			
6	3	63	00	0	0	0	0	0	0	0	20	0	120																			
6	17	63	00	0	0	0	0	0	0	0	40	0	10																			
7	15	63	100	0	0	20	0	0	0	0	60	0	40																			
8	5	63	00	0	0	0	0	0	0	0	0	0	0																			
8	12	63	200	0	0	0	0	0	0	0	220	0	130																			
9	3	63	00	0	0	0	0	0	0	0	0	20	40																			
9	16	63	100	0	0	0	0	0	0	0	70	0	20																			

PLANKTON POPULATION

STATE ALASKA

MAJOR BASIN ALASKA

MINOR BASIN NORTH PACIFIC OCEAN

STATION LOCATION SHIP CREEK AT

ANCHORAGE, ALASKA 110

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml.)	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH				PROTOZOA (Flagellates) (Number per ml.)	ROTIFERS										CRUSTACEA								NEMATODES (Number per liter)	OTHER ANIMAL FORMS (Number per liter)
															GENERA AND COUNT LEVEL (See text for Codes)											GENERA AND COUNT LEVEL (See text for Codes)							
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT			NUMBER PER LITER	1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	1ST		2ND		3RD			
															GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	19	62	92	33	14	17	2	12	35	5	33	-	-	0										0							0	0
11	5	62	92	30	14	10	46	8	2	6	46	-	-	0										0							0	0
11	19	62	92	75	46	3	31	3	37	3	16	20	-	0										0							0	0
12	5	62										-	-	0										0							0	0
4	18	63	2	27	92	21	82	10	14	7	35	-	-	0										0							0	0
4	29	63										-	-	0										0							0	0
5	27	63	2	20	92	14	14	8	46	6	52	-	-	-										-							-	-
6	3	63										-	-	-										-							-	-
6	17	63										-	-	-										-							-	-
7	15	63										-	-	-										-							-	-
8	5	63										-	-	-										-							-	-
8	12	63										-	-	-										-							-	-
9	3	63										-	-	-										-							-	-
9	16	63										-	-	-										-							-	-

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE ALASKA

MAJOR BASIN ALASKA

MINOR BASIN NORTH PACIFIC OCEAN

STATION LOCATION SHIP CREEK AT
ANCHORAGE, ALASKA 110

DATE OF SAMPLE					GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES									
BEGINNING			END								NEUTRALS							
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLORO-FORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	DIFFERENTIATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	19	62	10	25	5130	37	12	25	0	3	6	1	1	4	0	1	0	0	2
11	19	62	11	27	4870	54	10	44	0	2	4	1	1	2	0	1	1	0	2
11	27	62	12	5	5000	52	10	42	0	2	4	0	1	3	0	1	1	0	2
1	2	63	1	10	5000	35	10	25	0	2	3	1	0	2	0	1	1	0	3
2	1	63	2	9	5000	37	10	27	0	3	4	0	1	3	0	1	1	0	1
3	1	63	3	8	5000	45	12	33	0	4	4	0	0	4	0	1	1	0	2
4	1	63	4	10	5070	37	11	26	0	3	4	1	0	3	0	1	1	0	2
5	1	63	5	8	5000	171	75	96	4	18	21	2	2	16	1	7	6	1	18
6	1	63	6	9	5920	41	22	19	2	6	5	1	0	4	0	3	2	0	4
7	1	63	7	8	4850	32	13	19	0	4	3	0	1	2	0	2	1	0	3
8	1	63	8	9	5010	38	15	23	0	6	4	1	1	2	0	2	1	0	2
9	1	63	9	8	5040	42	13	29	1	5	4	0	1	3	0	1	1	0	1

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE ALASKA
MAJOR BASIN ALASKA
MINOR BASIN NORTH PACIFIC OCEAN
STATION LOCATION SHIP CREEK AT
ANCHORAGE, ALASKA

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	19	62	3.0	14.6	7.8	-	-	-	-	1.7	3	44	64	5	*25	31	.0	110	-
11	19	62	1.0	13.7	8.5	-	-	-	-	3.0	3	45	55	0	*25	20	.0	100	-
11	30	62	1.0	13.7	7.7	-	-	-	-	.0	6	46	76	0	*25	24	.0	85	-
12	5	62	2.0	13.9	7.9	-	-	.3	.6	2.7	7	48	72	5	*25	22	.0	110	-
12	12	62	2.0	14.0	8.0	7.0	-	-	-	.0	2	46	68	25	*25	23	.0	103	-
12	19	62	2.0	13.7	8.0	3.8	2	-	-	.0	3	48	68	0	*25	22	.0	100	-
12	27	62	2.0	14.4	8.0	2.7	-	-	.3	.0	3	48	88	0	*25	22	.0	85	-
1	4	63	1.5	13.0	7.8	1.6	-	.2	.4	.0	2	52	70	0	*25	23	.0	100	-
1	11	63	2.0	14.1	7.7	-	3	.3	.4	-	11	56	80	-	*25	28	.0	120	500
1	17	63	2.0	14.7	7.7	-	-	-	-	-	3	50	72	0	*25	22	.0	90	300
1	24	63	2.2	14.5	8.0	-	-	.2	.7	-	5	42	68	-	*25	17	.0	74	-
2	1	63	3.0	14.5	7.5	3.7	1	-	.9	-	2	50	72	5	*25	22	.0	90	500
2	7	63	.1	14.1	7.3	3.5	1	-	.6	.0	3	52	82	5	*25	24	.0	100	240
2	15	63	2.2	11.7	7.4	1.7	-	-	-	.0	3	52	75	0	*25	22	.0	83	20
3	8	63	-	-	7.4	-	-	-	-	-	4	50	76	10	*25	20	.0	81	-
3	14	63	1.5	10.0	7.6	2.3	-	-	.2	.0	3	56	84	5	*25	20	.0	99	-
3	21	63	2.2	9.4	7.7	3.2	-	-	-	.0	3	56	76	0	*25	19	.0	108	330
3	28	63	1.5	10.0	7.7	2.4	-	-	-	.0	3	56	80	0	*25	22	.0	115	230
4	4	63	1.6	10.5	7.8	-	-	-	-	-	4	56	84	0	*25	22	.0	94	250
4	11	63	1.8	9.9	7.7	-	-	-	-	-	4	56	76	0	*25	20	.0	87	-
4	18	63	1.0	13.6	7.8	-	-	-	-	-	3	56	84	0	*25	20	.0	102	-
4	29	63	3.0	11.9	7.7	-	-	-	-	-	3	52	60	15	*25	16	.0	79	1500
5	6	63	2.0	12.8	7.6	-	-	-	-	-	8	48	60	20	*25	14	.0	73	-
5	13	63	3.0	12.4	7.5	-	-	-	-	-	5	44	60	25	*25	13	.0	87	10000
5	20	63	6.0	12.1	7.7	-	-	-	-	-	3	40	44	15	*25	11	.0	63	1000
5	27	63	3.5	12.9	7.7	-	-	-	-	-	2	34	60	5	*25	24	.0	64	2300
6	3	63	6.0	12.0	7.5	-	-	-	-	-	3	38	48	5	*25	16	.0	68	150
6	10	63	5.6	12.4	7.5	-	-	-	-	-	5	34	48	5	*25	13	.0	65	*10
6	17	63	8.0	12.0	7.7	-	2	-	-	.0	4	42	48	5	*25	18	.0	91	*10
6	24	63	8.0	11.5	7.6	-	-	-	-	.0	4	36	48	15	*25	19	.0	87	100
7	1	63	6.5	11.9	7.1	-	-	-	-	.0	4	32	52	0	*25	17	.0	62	200
7	8	63	7.0	11.6	7.9	-	1	-	-	.0	3	34	52	0	*25	20	.0	64	100
7	9	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
7	15	63	-	11.1	7.0	-	-	-	-	-	2	36	64	0	*25	21	.0	59	-
7	22	63	9.5	10.9	6.8	-	-	-	-	.0	3	34	60	0	*25	22	.0	60	*31
7	29	63	8.0	12.3	7.7	-	1	.5	1.3	.0	5	34	60	0	*25	23	.0	63	*31
8	5	63	8.0	12.2	7.8	-	1	-	.2	.0	5	36	56	5	*25	22	.0	69	50
8	12	63	10.5	11.5	7.7	.6	1	-	.8	.0	4	36	60	0	*25	23	.0	81	*31

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE ALASKA
MAJOR BASIN ALASKA
MINOR BASIN NORTH PACIFIC OCEAN
STATION LOCATION SHIP CREEK AT
ANCHORAGE, ALASKA

110

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
8	19	63	9.0	12.3	7.8	–	1	.5	1.4	.0	5	40	58	0	*25	22	.0	74	470
8	26	63	7.0	11.9	7.7	–	11	–	1.1	.0	6	34	52	0	*25	22	.0	70	170
9	3	63	8.7	10.7	7.8	–	1	–	.6	.0	4	40	66	0	*25	25	.0	83	5
9	9	63	7.9	12.1	7.8	.5	–	.4	1.0	.0	3	54	64	0	*25	23	.0	78	95
9	16	63	6.8	12.7	7.9	–	21	.2	1.4	.0	2	46	54	0	*25	23	.0	78	20
9	23	63	4.5	12.5	7.9	.7	13	.5	1.0	.0	3	46	62	5	*25	24	.0	86	20
9	30	63	4.8	12.2	7.9	–	14	.3	–	.0	5	44	60	0	*25	25	.0	84	97

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station near Anchorage, Alaska
Operated by U.S. Geological Survey

STATE Alaska

MAJOR BASIN Alaska

MINOR BASIN North Pacific Ocean

STATION LOCATION Ship Creek at
Anchorage, Alaska

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	.171	.047	.067	.067	.028	.007	.021	.020	.623	.569	.408	.662
2	.171	.047	.067	.067	.028	.007	.021	.020	.623	.569	.408	.662
3	.171	.047	.067	.044	.028	.007	.013	.020	.623	.569	.408	.662
4	.171	.047	.067	.044	.028	.007	.013	.020	.623	.569	.408	.662
5	.171	.047	.067	.044	.028	.007	.013	.020	.623	.579	.408	.662
6	.171	.109	.067	.044	.028	.007	.013	.070	.623	.579	.495	.662
7	.171	.109	.067	.044	.028	.007	.013	.070	.623	.579	.495	.662
8	.171	.109	.067	.044	.028	.007	.013	.070	.623	.579	.495	.662
9	.171	.109	.067	.044	.028	.007	.013	.070	.623	.579	.495	.662
10	.171	.109	.067	.034	.028	.007	.013	.070	.623	.579	.495	.184
11	.171	.109	.067	.034	.024	.007	.013	.070	.623	.579	.495	.184
12	.171	.109	.067	.034	.024	.007	.013	.070	.623	.579	.495	.184
13	.171	.109	.067	.034	.024	.013	.013	.070	.623	.579	.495	.184
14	.171	.109	.067	.034	.024	.013	.013	.070	.470	.579	.495	.184
15	.171	.109	.067	.034	.024	.013	.014	.070	.470	.579	.495	.184
16	.171	.109	.067	.034	.024	.013	.014	.196	.470	.579	.495	.184
17	.081	.109	.067	.034	.024	.013	.014	.196	.470	.579	.495	.184
18	.081	.109	.067	.034	.024	.013	.014	.196	.470	.579	.495	.184
19	.081	.109	.067	.034	.024	.013	.014	.196	.470	.579	.495	.184
20	.081	.109	.067	.034	.024	.013	.014	.196	.470	.579	.495	.184
21	.081	.067	.067	.042	.021	.013	.014	.196	.470	.579	.495	.184
22	.081	.067	.067	.042	.021	.013	.014	.196	.470	.408	.495	.184
23	.081	.067	.067	.042	.021	.013	.014	.196	.470	.408	.495	.184
24	.081	.067	.067	.042	.021	.013	.014	.196	.470	.408	.495	.117
25	.081	.067	.067	.042	.021	.021	.020	.196	.470	.408	.495	.117
26	.081	.067	.067	.042	.021	.021	.020	.196	.569	.408	.662	.117
27	.081	.067	.067	.042	.021	.021	.020	.196	.569	.408	.662	.117
28	.081	.067	.067	.042	.021	.021	.020	.196	.569	.408	.662	.117
29	.047	.067	.067	.042		.021	.020	.196	.569	.408	.662	.117
30	.047	.067	.067	.042		.021	.020	.196	.569	.408	.662	.117
31	.047		.067	.028		.021		.623		.408	.662	

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